IT CORPORATION

RESPONSIVE TO THE NEEDS OF ENVIRONMENTAL MANAGEMENT

REVISED PLAN FOR INVESTIGATION AND SITE ASSESSMENT FOR POTENTIAL SUBSURFACE POLLUTION AT POWERINE OIL COMPANY REFINERY SANTA FE SPRINGS, CALIFORNIA

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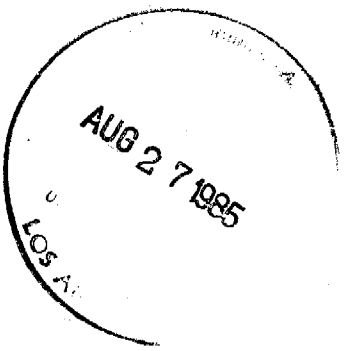
IT CORPORATION



Project No. 850009
July, 1985

IT CORPORATION

July 19, 1985

Project No.: 850009/899

Mr. Matt Stewart
President
Powerine Oil Company
12354 Lakeland Road
P.O. Box 2108
Santa Fe Springs, California 90670-9883

Dear Mr. Stewart:

Transmitted herewith are four copies of our workplan entitled, "Revised Plan for Investigation and Site Assessment for Potential Subsurface Pollution at Powerine Oil Company Refinery, Santa Fe Springs, California", to be submitted to the Los Angeles Region, California Regional Water Quality Control Board.

If you have any questions, please do not hesitate to contact either Drs. Mehran or Esmaili.

Regards,

Edward B. Sirota
Director of Technical Services
and Site Remediation

EBS:jb

Enclosures

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

REVISED PLAN FOR INVESTIGATION AND SITE ASSESSMENT FOR POTENTIAL SUBSURFACE POLLUTION AT POWERINE OIL COMPANY REFINERY SANTA FE SPRINGS, CALIFORNIA

INTRODUCTION

During February, 1985, the California Regional Water Quality Control Board, Los Angeles Region, issued an order to refineries in their region to "conduct a subsurface investigation of their facilities to detect and assess any ground water pollution which may be present." The Powerine Oil Company refinery is located in the Region, in Santa Fe Springs, in an area generally bounded by Florence Avenue and Lakeland to the north and south and extending east of Norwalk Boulevard, as shown in Figure 1. In response to this order, No. 85-17, Powerine Oil Company submitted a plan to the Regional Water Quality Control Board dated May 19, 1985. This plan was determined to be inadequate by the board, which, in their letter dated June 24, 1985, specified the information that was needed to be obtained to respond to their order, No. 85-17. This plan, prepared by IT Corporation, is a revision of the previous submittal and is in response to the original order and the letter dated June 24, 1985.

In preparation of this revised workplan, additional data has been collected regarding the refinery's history and operation, and geology, hydrogeology, and ground water usage in the area. This information is presented in this workplan and would be supplemented and expanded upon in the final report.

HISTORY

A general history of Powerine Oil Company up to 1984 is shown in Exhibit 1. In brief, Powerine Oil Company took over a small foundry refinery in the late 1930's. Significant additions to the refinery were made in 1954, 1961, 1967, 1974, and 1982. Up until 1960, the refinery was a 7,000-barrel-per-day operation with distillation and some thermal cracking. In 1968, the cat cracker and alkylation unit were added and crude storage expanded so the refinery could process 27,000 barrels per day. In 1974, a new crude unit was added to the refinery, increasing capacity to 47,000 barrels per day. The last refinery expansion occurred in 1982 when the heavy oil upgrading plant, including a coking operation, coke storage, and additional tank storage capacity were added to the refinery. Since April 1984, the refinery has been closed except for some product storage and maintenance of existing equipment.

As is true of any major industrial facility, drips, leaks and spills occur. In refineries, however, where you have volatile substances and high temperature and rotary equipment operating, extra care is taken to fix drips and leaks very quickly to prevent possible explosions and fires. In addition, where toxic substances are encountered, special care is used to mitigate against any worker accidents. Handling of unrefined and refined product outside of the refinery area in the tank farms and pipings to the tank farms is policed; however, in these areas, there is a higher potential for having significant spillage, even with the monitoring that is occurring at least on a daily and often three times a day basis. At the Powerine Oil Refinery, there have been several leaks from storage tanks as shown on Figure 2.

Other potential sources of ground water polution are buried sumps and underground tanks. In previous geotechnical explorations of the area, Powerine has encountered some buried oil well drilling sumps and some larger sumps which could also be present. Underground tanks are also present on the site and Powerine has registered five of those as shown in Exhibit 2. Several other underground structures exist and all are shown on Figure 2.

SITE HYDROGEOLOGY

General hydrogeologic characteristics of the area is derived from Bulletin No. 104 (State of California Department of Water Resources). The soil and shallow ground water conditions at the site is derived from soil borings made at the site by Fugro, Inc. in July and November 1980, as part of geotechnical investigations for installation of new units. The locations of the borings are shown in Figure 2 and boring logs are presented in Exhibit 3. Information on the wells at the site was obtained from Mr. Dale Epperby, Water Well Supply, who has been involved with water wells at the site and the area of Santa Fe Springs for many years.

The Powerine site is located on the Santa Fe Springs Plain, a low and slightly rolling topographic feature. The site is underlain by the Lakewood Formation, consisting of terrace deposits, Palos Verdes sand, and unnamed upper Pleistocene deposits. In the upper part of the Lakewood Formation, lithologic changes are rapid with discontinuous permeable zones and considerable variation in particle size. These features represent typical stream type alluviation with flood plain fine-grained sediments comprising from 40 to 80 percent of the total deposits. The Lakewood Formation unconformably overlies the lower Pleistocene San Pedro Formation at the site area. The San Pedro Formation includes all strata of lower Pleistocene age. Lithology of the San Pedro Formation is described as gray sand with small gravel interbeds. Fine-grained members in the San Pedro Formation are generally marine type, blue to black clays, sea muds, or quicksands with abundant shells. The total thickness of the Lakewood and San Pedro Formations at the site area is over 1,000 feet.

There are several regional water-bearing units in the Lakewood and the San Pedro Formations. The major water-bearing unit of interest in this study is the Exposition aquifer, the upper water-bearing unit in the Lakewood Formation. The Exposition aquifer is separated from a deeper water-bearing zone by an unnamed aquiclude. The Exposition aquifer consists of interbedded fine materials, as well as permeable zones. The materials in the Exposition aquifer range in size from coarse gravel to clay, with fine deposits separating the lenticular sandy and gravelly beds. The general ground water flow direction in the area is towards southwest, based on the ground water data of all the wells in the area (Annual Survey Report on Ground Water Replenishment, 1985). However, these wells are mostly completed in the deeper aquifers and not necessarily represent the Exposition aquifer.

Stratigraphy

Based on existing soil borings (Exhibit 3), the site is underlain primarily by a sandy-silty clay layer, extending from surface to depths ranging from 6 to 13 feet (Sections A-A' and B-B' in Figures 3 and 4, respectively). Below the clay zone layers of sandy silt to silty sand and sandy-silty clay to clayey silt overlie a thick deposit (on the order of 50 feet) of medium to fine sand. At a depth of about 50 to 60 feet below the ground surface, there appears to be a 4 to 7 feet thick silty clay to clayey silt layer. Below this layer another silty sand to sand layer extends to depths ranging from 90 to 94 feet below the ground surface. Below these depths another silty clay to clayey silt layer is encountered. This layer extends to a depth of 100.5 feet in Boring 19.

Ground Water

Ground water was only encountered during drilling in Boring 19 at a depth of approximately 92 feet. Free ground water flow was not observed in Boring 28 which extends to a depth of 100.9 feet. The available information is not conclusive to determine whether the observed ground water in Boring 19 represents a regional ground water or if it is just an indication of a local perched ground water. No other shallow perched ground water was encountered in the soil borings.

A total of eight water wells were made at the site, however, only wells 6, 7, and 8 (Figure 2) can be presently operated but have not been used since April 1, 1984. The other wells are grouted and abandoned. The wells were being used to provide process water for the refinery. The available information on the wells at the site is presented in Table 1.

As can be noted from Table 1, the wells at the site are deep, extending to deep water-bearing zones, most likely all in the San Pedro Formation. It seems that the shallow water-bearing zone(s) could not provide any or enough water to meet the needs of the refinery operation. In addition, according to Mr. Dale Epperby, the shallow water in the area is salty and cannot be used.

Table 2 summarizes the available water quality of the ground water at Wells 5, 6, 7, and 8, sampled on June 8, 1980. Table 3 presents the water quality data on a sample, collected on March 12, 1931 from No. 1-A sulphur well located 500 feet south of Well 6 at the Norwalk State Hospital ground. Major dissolved chemical constituents in all the wells include calcium, magnesium, sulphate, carbonate/bicarbonate (alkalinity) and chloride. The wells all exceed secondary water standard for hydrogen sulfide concentration. The on site well waters had to be treated for hydrogen sulfide before being used at the refinery. Rather high hydrogen sulfide in the wells could be natural and due to a very reducing condition in the subsurface environment in the San Pedro Formation.

SCOPE OF WORK

The scope of work will include additional literature research, well installation and soil sampling, well sampling and analysis, data analysis, and reporting.

Additional Data

Data has been collected regarding site history and ground water data. Additional data, including historic air photographs, historic topographic maps, additional Powerine drawings and records, additional interviews with current and ex-Powerine employees, and further review of already collected data, will be performed to obtain any other information regarding potential migration of chemicals into the ground water. This additional data review will be performed concurrently with the initial phases of the drilling program and revisions made in the subsequent phase(s) where appropriate.

PHASE 1 - WELL INSTALLATION AND SOIL SAMPLING

Three operating wells exist on the Powerine site. These wells are located as shown in Figure 2. Water quality samples from these wells were taken recently by a consultant working for others. This information, plus additional sampling of these wells should provide information on ground water direction, gradient, and quality in "lower" usable aquifers.

Subsurface information currently available indicates that water may exist at a depth of 92 feet. To obtain additional information regarding the subsurface stratigraphy and to define the site ground water gradient, four wells will be installed in the Phase I program. These wells will be drilled along the perimeter of the property, three downgradient and one upgradient of the refinery area as shown on Figure 2. The wells will be drilled with six-inch I.D. hollow stem augers to about 80 to 90 feet. If ground water is not encountered at this depth, the wells would be continued, using rotary wash drilling equipment or air rotary equipment, if available. These wells would not be drilled below about 150 feet. Between wells, the augers or drill pipe

would be cleaned with a hot water washer or steam cleaner to prevent cross contamination between wells.

Wells would be sampled, using a modified California ring sampler at depth intervals of five feet. The sampler would be cleaned between each sample interval in a TSP solution and then tap water. Drilling would be under the continuous supervision of a field engineer or geologist who would log the hole, assist in obtaining samples, and prepare the appropriate chain of custody and field documentation. All samples recovered from the wells would be sniffed with an organic vapor analyzer to determine if there are any volatile organic pollutants in the soil.

Field programs would be performed under the guidance of IT health and safety personnel and plant rules, whichever are stricter. A field health and safety plan will be prepared and morning tailgate meetings convened to provide appropriate guidance to personnel.

Soil Sample Handling Procedures

Samples recovered in the field would be placed in ice chests and stored at 4°C. Each evening, the samples would be driven to the IT laboratory in Irvine and selected samples would be sent to the IT analytical laboratory for chemical analysis shown on Table 4. These laboratories are in the EPA contract laboratory program and perform analysis according to the appropriate EPA methods. It is anticipated at this time that two to four samples from each boring would be submitted for laboratory analysis. Samples not submitted to IT analytical laboratories, would be stored in the geotechnical laboratory. These samples would be used for preparation of final field logs. Upon completion of the project, the samples would either be returned to Powerine or disposed of at the appropriate disposal site.

Well Installation

Upon completion of the boring, four-inch PVC casing will be installed and a well developed. Typical well installation to be used on this project is shown on Figure 5. Where no water is encountered, the borehole would be cemented up to the top of the lowest clay layer prior to placing the casing. This is to close off a potential pathway for migration to lower soil zones and the aquifer. Well development would consist of surging, bailing, pumping, or vacuuming water from the well until the well was clear and recovered groundwater properties stabilized. Equipment used in well development will be hot water or steam cleaned between each well.

Water levels would be taken after well development and one week later. The well would then be purged of about four well volumes and a sample obtained, using either a teflon bailer or teflon bladder pump. Samples obtained will be

tested for the constitutents as shown in Table 4. Special care will be used in cleaning sample equipment to prevent cross contamination of wells. In general, two sets of equipment will be used, those for wells with free product and those for relatively clean wells with only dissolved product.

Free product will be looked for in the well prior to any sampling. In order to determine if free product is present and what thickness, a clear acrylic bailer will be sent down the well and a sample pulled. In addition to using the acrylic bailer, an ORS type detector may be used to measure the thickness of free product and top of water surface.

PHASE 1 - DATA ASSESSMENT

Upon completion of the Phase 1 program, information obtained from the literature review and well installation program would be assessed and the installation procedures, number, depth, and location of proposed Phase 2 wells revised if appropriate. If revisions are proposed then it will be submitted to the Regional Board for review and comments, prior to implementation.

PHASE 2 - FIELD INVESTIGATION

Phase 2 investigation consists of the drilling and sampling of additional borings and wells. In this phase of the program, we propose to drill and install about six more wells and ten borings at the locations shown on Figure 2.

Well Installation and Soil Sampling

The location of the wells provides for a downgradient perimeter spacing of about 500 feet between wells. This should be adequate to intercept free product plumes migrating off site, if any. During Phase 1, information would be gathered to assist in determining if different well installation methods were needed. Of particular importance to well installation is the depth due to the depth limitations on the preferred drilling method using hollow stem augers. Soil sampling would be done using the procedures described previously; however, sampling intervals may be extended to 10 feet, particularly in some of the wells. Borings would be drilled to the top of the clay layer anticipated at a depth of 50 to 60 feet. Information from the borings would tell us whether product had migrated through the soil and/or if it is perched on top of the upper clay.

Vapor Monitoring Wells

In eight of the shallow borings (Figure 2), two-inch PVC that is slotted below the upper 10 feet will be installed. Wells will be sealed in the upper 10 feet and a small tree installed on top of each well to provide for purging and sampling of hydrocarbons using an OVA meter.

These wells would be sampled by purging the wells of trapped vapor using a high speed vacuum pump, then pulling formation vapors through the OVA meter. Wells would be monitored upon completion of the installation, after the seal has set, and about two weeks later. Depending on the results of additional monitoring, more detailed sample analysis may be needed.

Sample Handling and Well Installation

Sample handling and well installation will be the same as Phase 1.

PHASE 2 - DATA ASSESSMENT

At the completion of Phase 2, a report would be prepared assessing the extent of hydrocarbon migration in the soil and the ground water. If free product is found, the extent and thickness will show on a refinery plan and contours drawn, if sufficient data is available.

In addition, this report would include:

- Description of field exploration program.
- Boring and well logs providing:
  - Soil description/classification;
  - Samples sent for analysis;
  - Well installation data, such as screen interval, gravel pack, type and length, seal location, etc.;
  - Water levels.
- Vapor monitoring data.
- Description of analytical program, including:
  - Tabular summary of all analytical data;
  - Laboratory reports.
- History of site development as it effects potential for ground water contamination.
- Plan showing location of all suspected and confirmed areas where leaks occurred of hydrocarbons.
- Plan showing extent of vapor plumes, if any.
- A plan for additional field exploration and sample analysis to better define free, dissolved, and vapor phase plumes, if necessary.

SCHEDULE

The anticipated schedule for the work is shown in Figure 6. This schedule can be compressed by initiating Phase 2 about one week after sampling (determining gradient) of wells in Phase 1.

CONCLUSION

The proposed phased workplan provides a logical method to assess the potential for ground water degradation at the Powerine Oil Company Refinery due to post hydrocarbon drips, leaks and spills. Modifications in the program may be required as the data is obtained and the phased program allows a convenient step in time at which to accomplish those modifications.

If you have any questions regarding this program, please do not hesitate to contact Mssrs. Sirota or Mehran of IT Corporation.

Respectfully submitted,

IT Corporation

For E. Sirota

Edward Sirota
Director of Technical Services
and Site Remediation

TABLES

TABLE 1

AVAILABLE DATA ON THE WELLS AT
THE POWERINE SITE

WELL NO.	DEPTH (ft)	DEPTH TO STATIC WATER LEVEL (ft)	PERFORATED INTERVAL (ft)	LOCATION
1	NA	NA	NA	NA
2	275	NA	NA	Figure 2
3	266	NA	NA	NA
4	609	NA	580-600	NA
5	780	NA	NA	Figure 2
6	840	109 (Date ?)	NA	Figure 2
7	690	NA	450-530 600-690	Figure 2
8	994	75 (Jan 1984)	NA	Figure 2

NA = Data not available.

TABLE 2

WATER ANALYSIS REPORT
ON WATER SAMPLES FROM THE
ON SITE WELLS*

DETERMINATION	NO. 5 WELL	NO. 6 WELL	NO. 7 WELL	NO. 8 WELL
pH	8.1	8.2	8.5	8.3
Specific Conductance, micromnos, 25°C	1,242	870	1,067	1,188
Phenolphthalein Alkalinity as $CaCO)_3$, ppm	0	0	10	0
Methyl Orange Alkalinity as $CaCO_3$, ppm	258	314	352	237
Sulfate and Sulfite as SO_4, ppm	397	90	200	293
Chloride as Cl, ppm	109	89	98	102
Total Hardness as $CaCO_3$, ppm	357	141	232	368
Calcium as $CaCO_3$, ppm	211	86	129	224
Magnesium as $CaCO_3$, ppm	145	55	103	144
Silica as SiO_2, ppm	28.0	25.3	29.4	28.8
Total Phosphate as PO_4, ppm	<0.4	<0.4	<0.4	<0.4
Total Inorganic Phosphate as PO_4, ppm	<0.2	<0.2	<0.2	<0.2
Ortho Phosphate as PO_4, ppm	<0.2	<0.2	<0.2	<0.2
Chromate as CrO_4, ppm	0	0	0	0
Chromium as Cr, ppm	0	0	0	0
Total Copper as Cu, ppm	<0.05	<0.05	<0.05	<0.05
Total Iron as Fe, ppm	0.12	0.12	0.12	0.33
Soluble Zinc as Zn, ppm	0.10	<0.1	<0.1	0.1
Sulfides as H_2S, ppm	1	18	28	1

*Water Quality Analysis Report, Betz, Trevose, Pennsylvania June 8, 1980.

TABLE 3

RESULTS OF WATER ANALYSIS REPORT* ON
WELL NO. 1-A SULPHUR AT THE NORWALK
STATE HOSPITAL GROUND

NO. 1-A SULPHUR WELL

		PARTS PER MILLION	GRAINS PER U.S. GALLON
MINERAL SUBSTANCES:			
Silica	SiO_2	12.8	0.75
Iron and Aluminum Oxides	R_2O_3	0.6	0.03
Calcium	Ca^{++}	31.3	1.82
Magnesium	Mg^{++}	10.8	0.63
Sodium	Na^{+}	153.4	8.94
Bicarbonates	HCO_{3-}	192.9	11.25
Carbonates	CO_{3--}	54.0	3.15
Chlorides	Cl^{-}	80.4	4.69
Sulphates	SO^{--}	90.6	5.28
Nitrates	NO_{3-}	-	-
Total Solids	-	559.1	32.60
MINERAL SALTS: (Hypothetical)			
Iron Bicarbonate	$Fe(HCO_3)2$	-	-
Calcium Bicarbonate	$Ca(HCO_3)2$	125.3	7.31
Magnesium Bicarbonate	$Mg(HCO_3)2$	63.5	3.70
Sodium Bicarbonate	$NaHCO_3$	63.0	3.67
Calcium Sulphate	$CaSO_4$	1.5	0.09
Magnesium Sulphate	$MgSO_4$	1.0	0.06
Sodium Sulphate	Na_2SO_4	131.1	7.64
Calcium Chloride	$CaCl_2$	none	-
Magnesium Chloride	$MgCl_2$	none	-
Sodium Chloride	NaCl	132.6	7.73
Sodium Carbonate	Na_2CO_3	95.4	5.56
Iron Oxide	Fe_2O_3	trace	-
Aluminum Oxide	Al_2O_3	0.6	0.03
Uncombined + Insol	SiO_2	12.8	0.75

TABLE 3
(Continued)

	PARTS PER MILLION	GRAINS PER U.S. GALLON
HARDNESS: (In terms of Calcium Carbonate, $CaCO_3$)		
Due to Lime Salts	78.4	4.57
Due to Magnesia Salts	44.2	2.58
Due to Iron Salts	-	-
Total Hardness	122.6	7.15
Temporary Hardness	120.7	7.04
Permanent Hardness	1.9	0.11
TREATMENT, per 1,000 gallons to result in a softened water:		
Hydrated Lime	$Ca(OH)_2$	0.75 pounds
Soda Ash	Na_2CO_3	none
Hydrogen Sulphide, free and combined	Parts per million H_2S	2.42

*Sample was submitted by State Department of Public Works to Los Angeles Testing Laboratory, on March 12, 1931.

TABLE 4

CONTAMINANT SURVEY PARAMETERS

PARAMETER	METHOD		
	SOIL	LIQUID HC	GROUND WATER
Total Organic Carbon	*	*	*
Oil and Grease (If TOC cannot be done)	+	+	*
Chlorides	-	-	*
Sulfates	-	-	*
Phenols	*	*	*
Volatile Organics	*	*	*
Total Organic Halogens	*	*	*
Metals			
Arsenic	*	*	*
Cadmium	*	*	*
Chromium	*	*	*
Cobalt	*	*	*
Cyanide	*	*	*
Lead	*	*	*
Mercury	*	*	*
Molybdenum	*	*	*
Nickel	*	*	*
Selenium	*	*	*
Vanadium	*	*	*
Zinc	*	*	*
pH	-	-	*
Specific Conductance	-	-	*
Total Hydrocarbon (in vapor)	x	-	-

Note: All the samples would be submitted to IT Analytical Laboratories for chemical analysis. These laboratories are in the EPA Contract Program and perform analysis according to the appropriate EPA Methods.

* According to appropriate EPA Methods
\+ According to appropriate Standard Method
x Portable analyzer (GC/FID, if needed)
\- No analysis

FIGURES

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7-12-85		

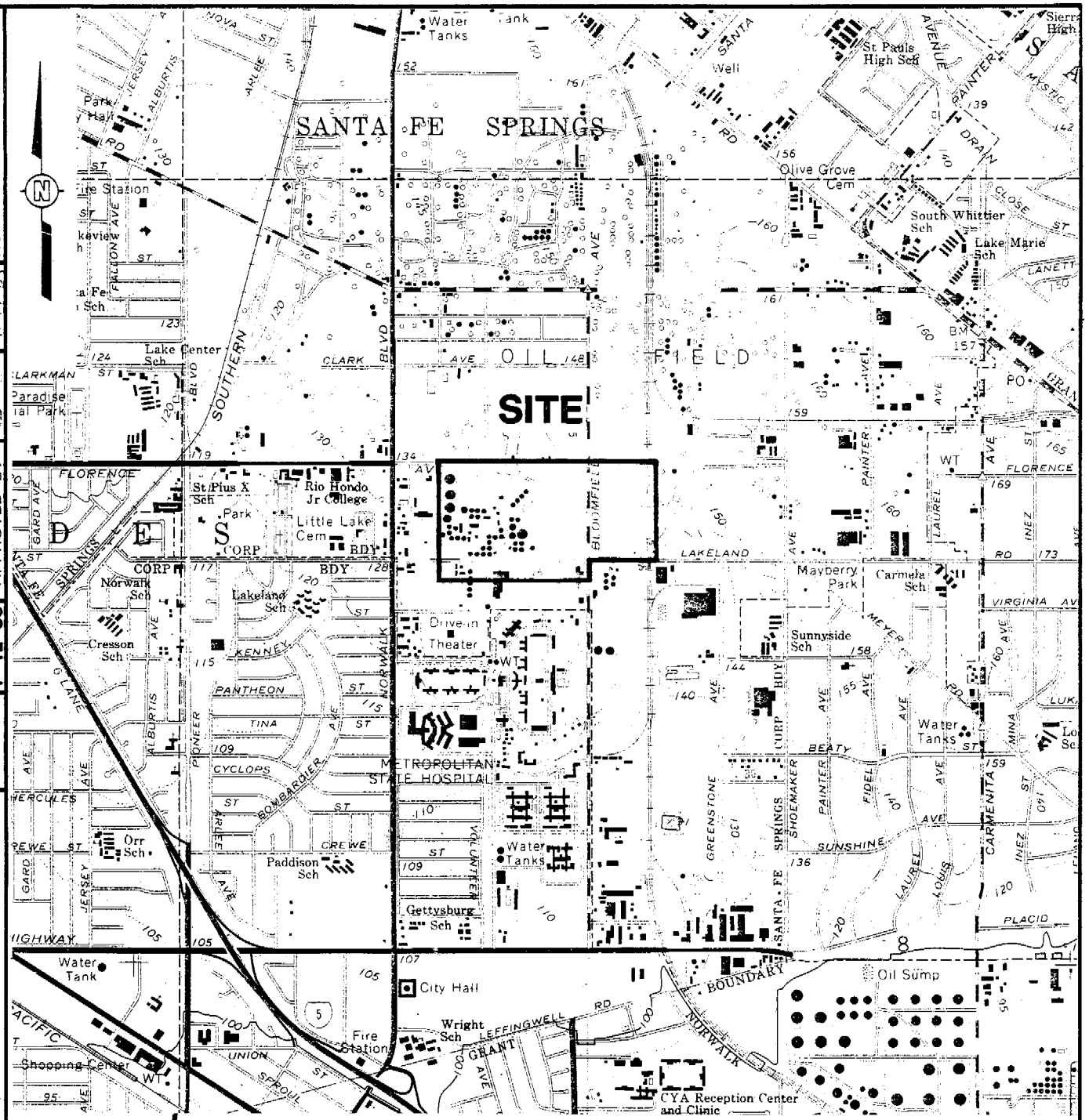

FIGURE 1

SITE VICINITY MAP

PREPARED FOR

POWERINE OIL COMPANY

SANTA FE SPRINGS, CALIFORNIA

REFERENCE:

7.5 MINUTE USGS TOPOGRAPHIC MAP OF WHITTHIER, CALIFORNIA QUADRANGLE

DATE:1965, PHOTOREVISED 1981

SCALE: 1" 2000'

IT ... Creating a Safer Tomorrow

65360

"Do Not Scale This Drawing"

FIGURE 2

SITE PLAN

PREPARED FOR

POWERINE OIL COMPANY-REFINERY
SANTA FE SPRINGS, CALIFORNIA

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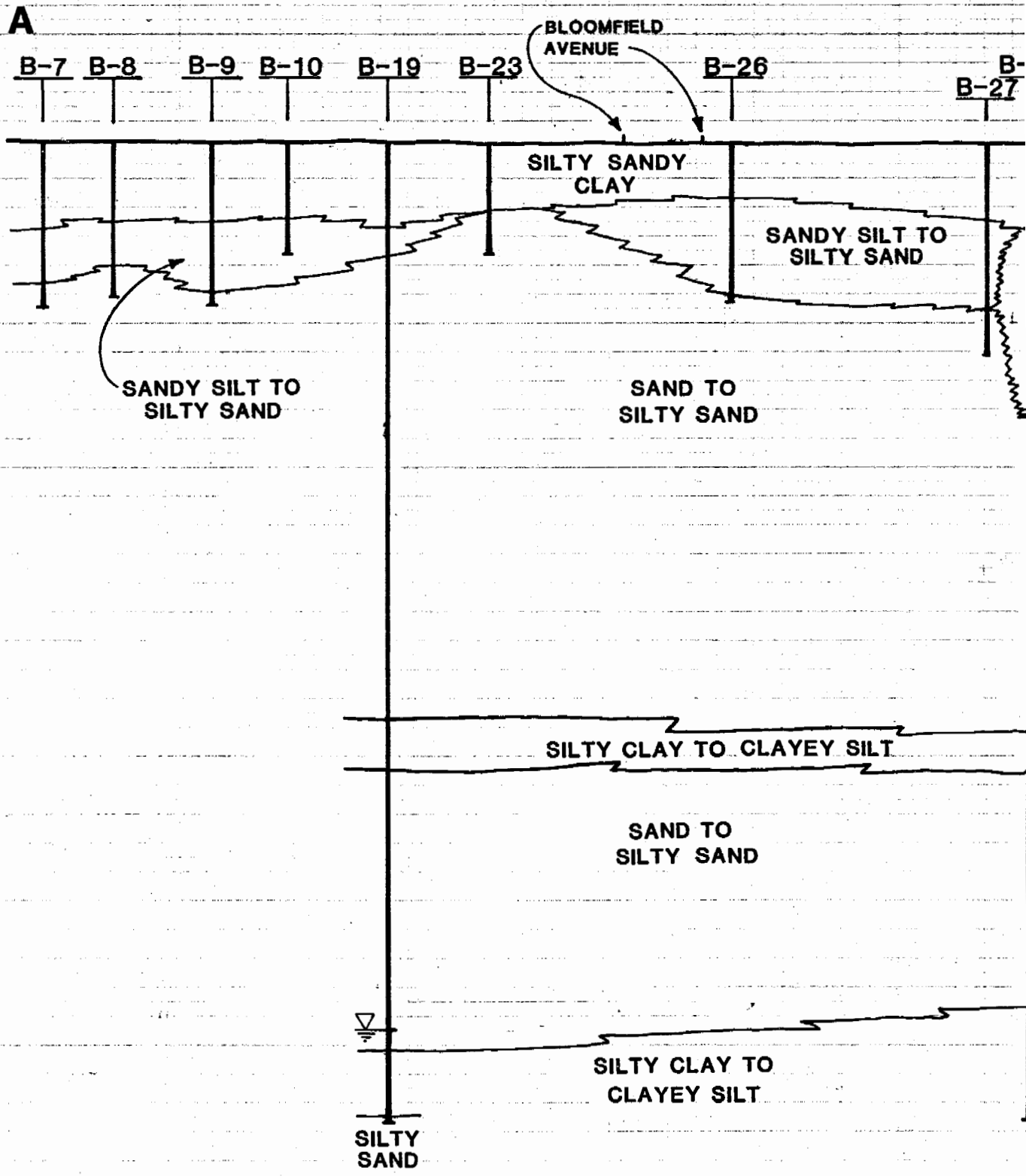

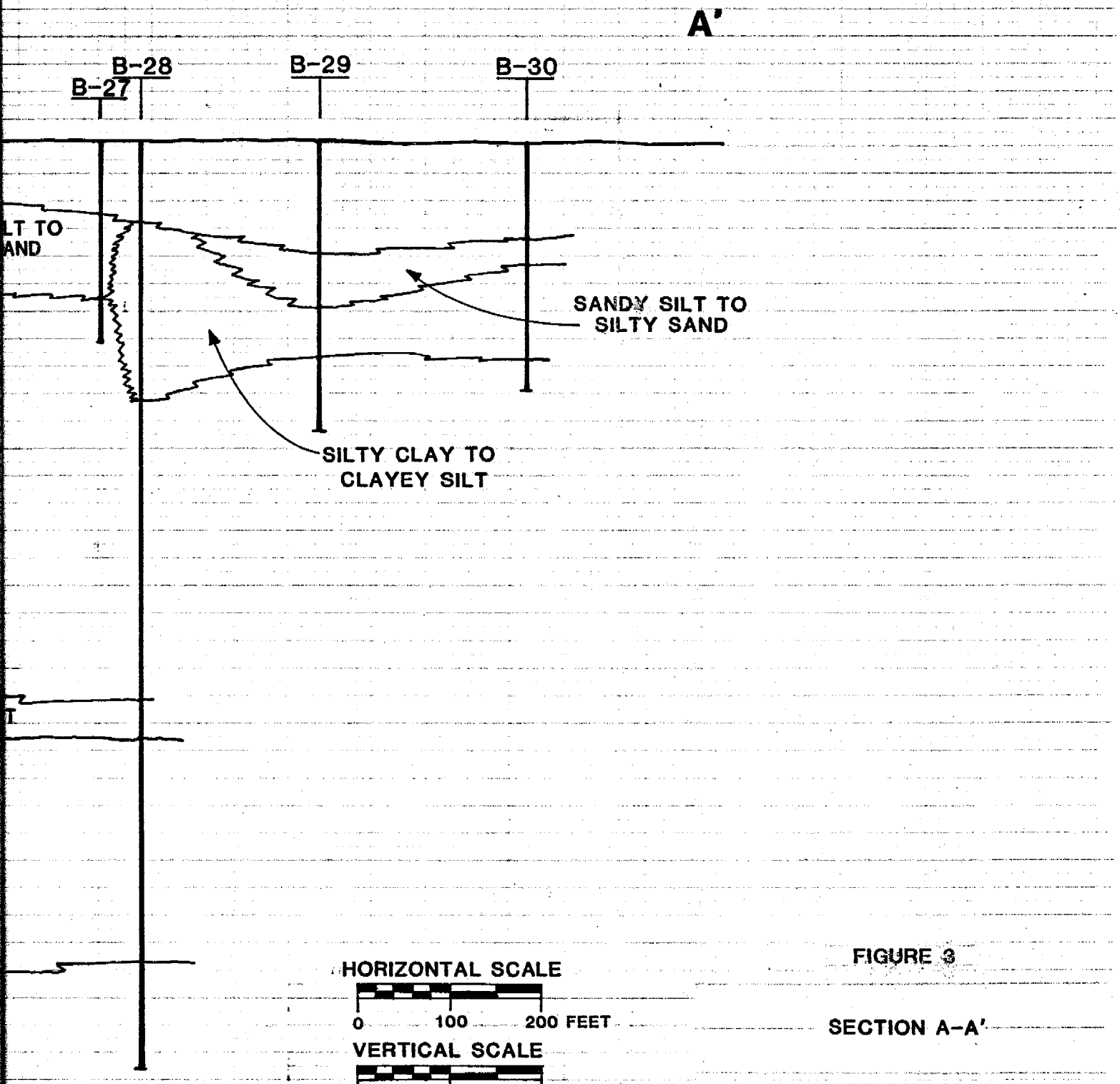

HORIZONTAL SCALE

0 100 200 FEET

VERTICAL SCALE

0 10 20 FEET

NOTE:
SEE OVERLAY #2 FOR LOCATION OF THIS SECTION

FIGURE 3

SECTION A-A'

PREPARED FOR

POWERINE OIL COMPANY-REFINERY

SANTA FE SPRINGS, CALIFORNIA

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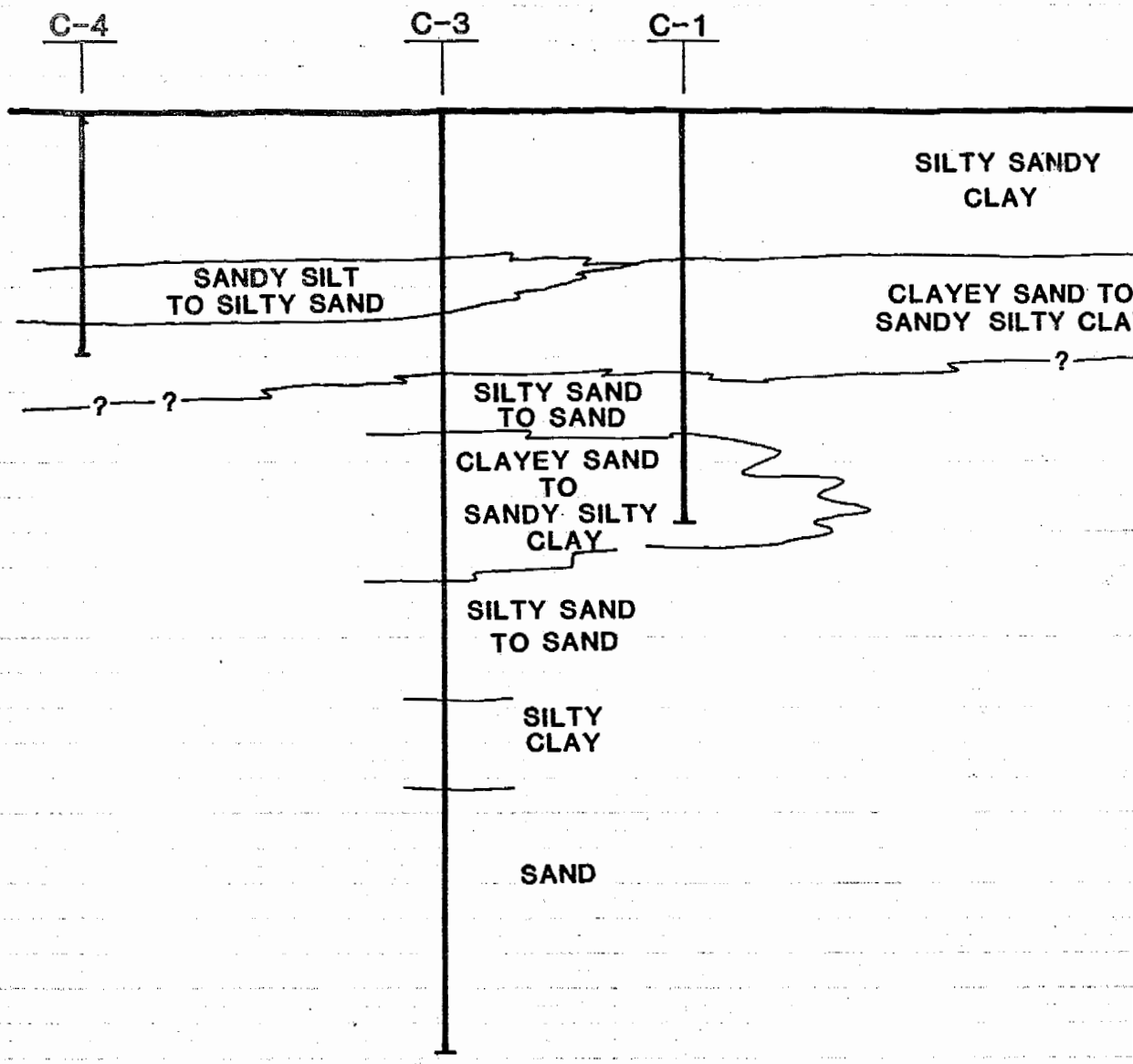
7-17-86	APPROVED BY	
	7-14-85	
	7-14-85	

B



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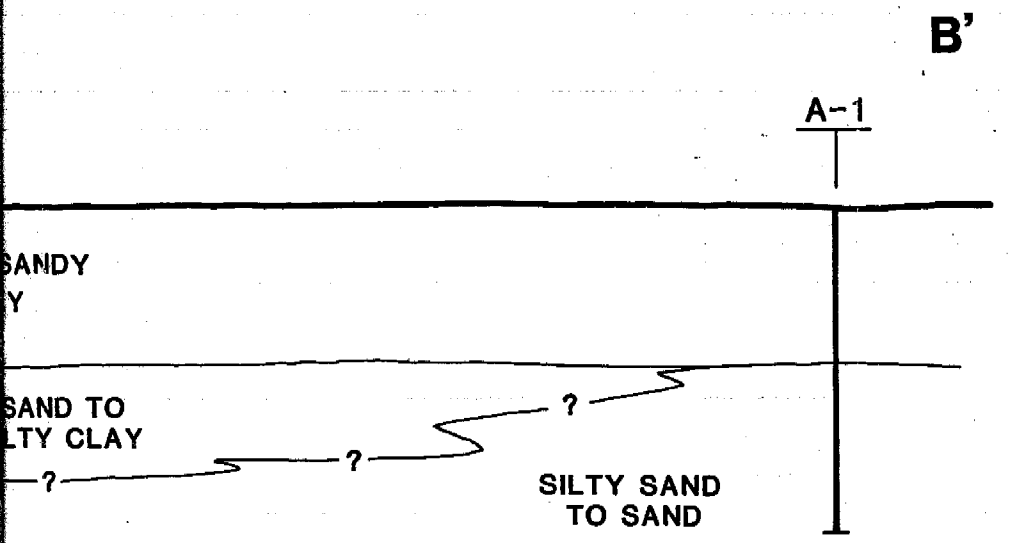

HORIZONTAL SCALE

0 40 80 FEET

VERTICAL SCALE

0 10 20 FEET

NOTE:
SEE OVERLAY #2 FOR LOCATION
OF THIS SECTION

FIGURE 4

SECTION B-B'

PREPARED FOR

POWERINE OIL COMPANY-REFINERY

SANTA FE SPRINGS, CALIFORNIA

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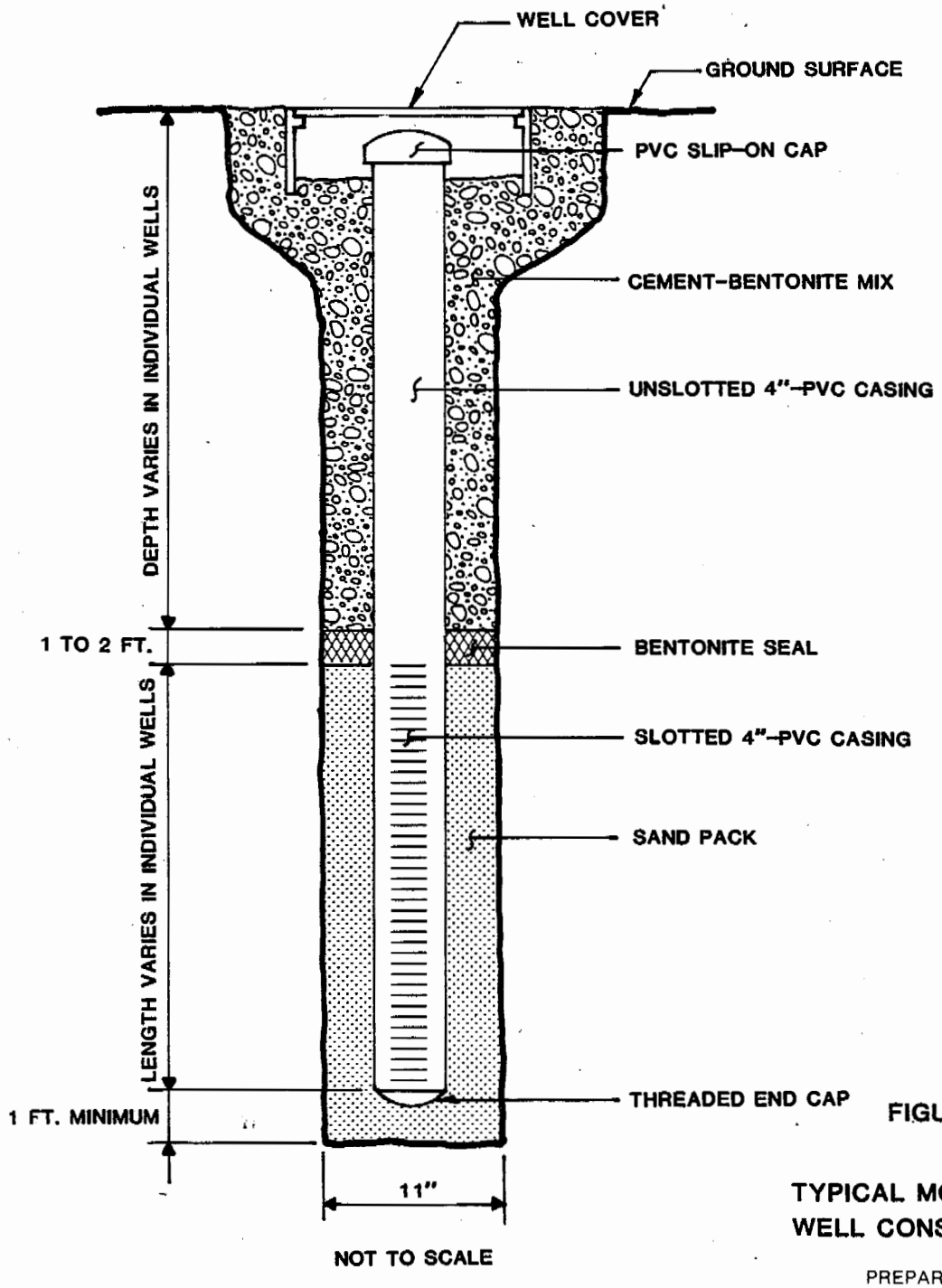

FIGURE 5

TYPICAL MONITORING WELL CONSTRUCTION

PREPARED FOR

POWERINE OIL COMPANY-REFINERY
SANTA FE SPRINGS, CALIFORNIA

NOTE:

WHERE POSSIBLE SCREEN WILL EXTEND 20 FEET BELOW AND 10 FEET ABOVE GROUND WATER LEVEL.

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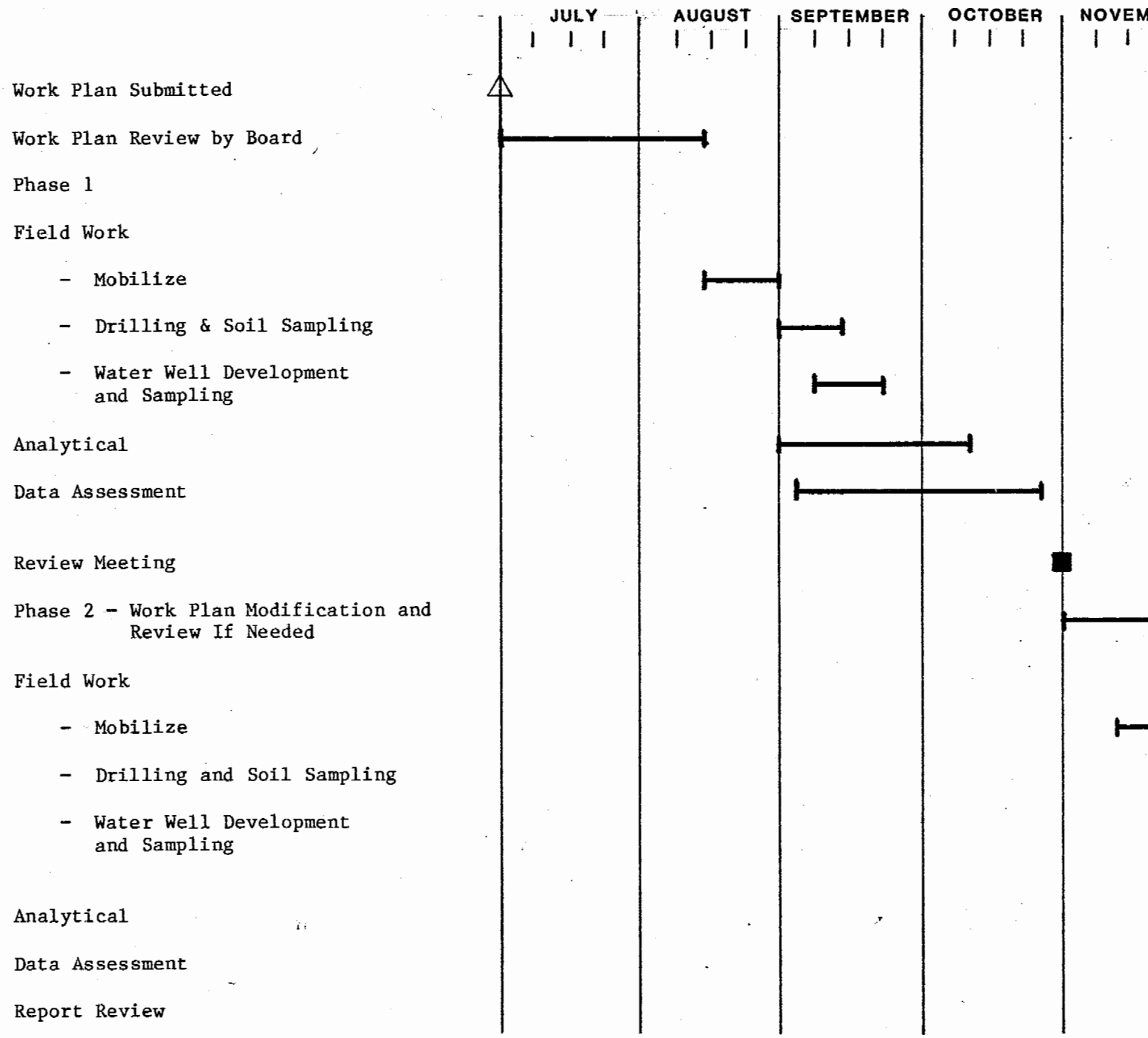
"Do Not Scale This Drawing"

FIGURE 6

SCHEDULE



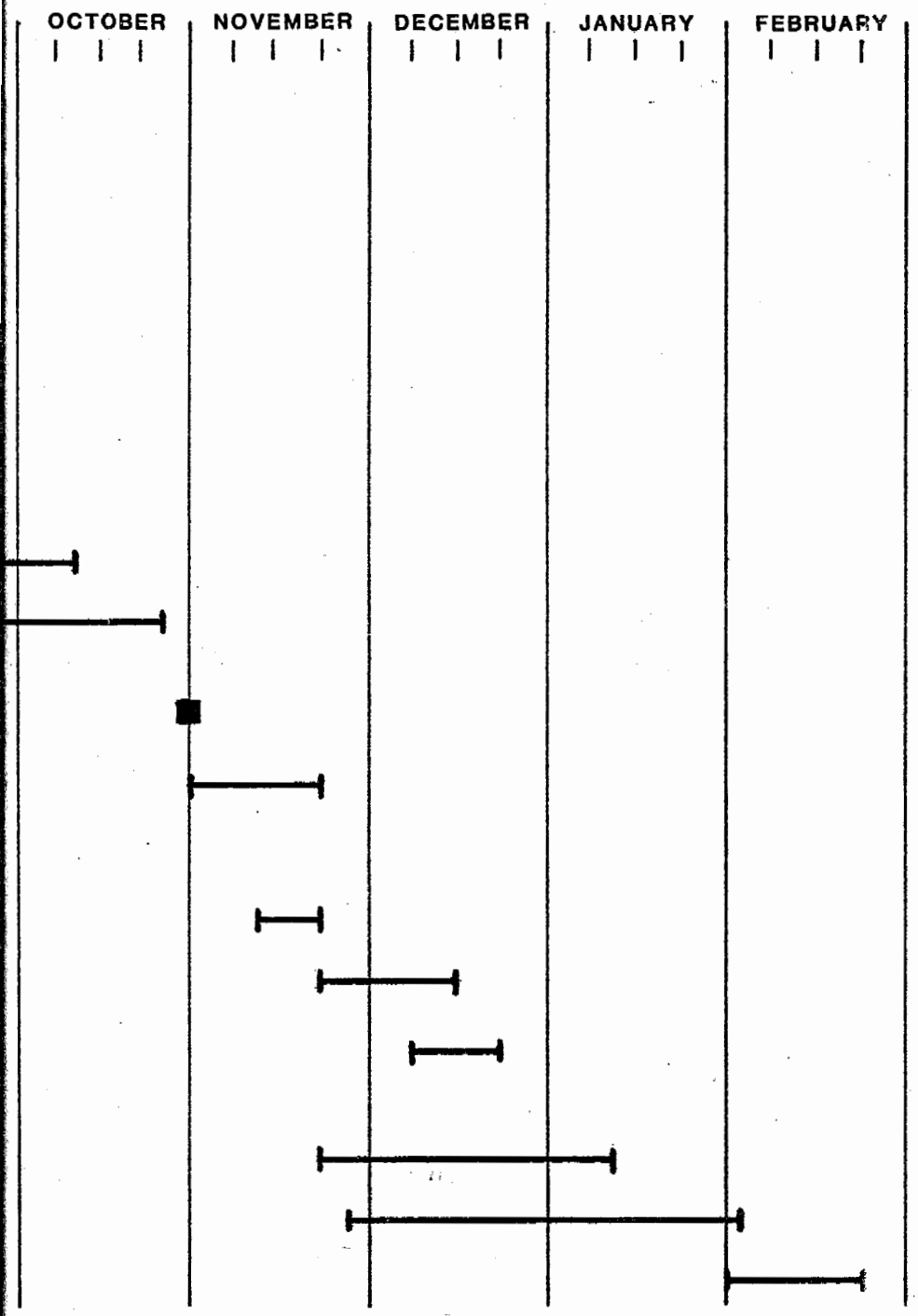

OCTOBER
NOVEMBER
DECEMBER
JANUARY
FEBRUARY

EXHIBIT 1

EXHIBIT 1

HISTORY

Powerine Oil Company had its beginning in the late 1930's when Harry S. Rothschild, Sr., took over a small foundering refinery in a corner of a pasture in Santa Fe Springs. Through foresight and innovative leadership, this family owned company grew to one of the west's largest independent oil companies operating in all phases of the industry; drilling, production, refining, service stations, trucking, pipelines and terminals.

Powerine has a record of continuously expanding resources, backing up the ability to produce and deliver - on time, at low prices, with consistent high quality.

1941 - Purchase of first new truck unit for product delivery.

1946 - Brought into production first oil well.

1950 - Opened its original self-serve station; one of the first of its kind selling over 500,000 gallons in the first month's operation.

1954 - Added platinum process to the refinery. First of its kind on the west coast and second in the United States; first 95 octane gasoline introduced on the west coast.

1961 - Completion of the Lomax Refining Unit - The first commercial hydrogen cracking process in the world; first 100 octane gasoline on the west coast.

1964 - Terminal and Pipeline Expansion - Long Beach Marine Terminal; No. 1 pipeline from Long Beach to Santa Fe Springs; San Diego Terminal; Phoenix Terminal.

1966 - Completed construction of Oakland Terminal.

1967 - Added FCC Complex (fluidized catalytic cracker) to refinery; increased gasoline producing capability.

1968 - Introduced the coin-operated, change making dispenser to self-service gasoline stations.

1970 - Added terminal in Tacoma, Washington.

1971 - Added No. 4 pipeline from the Los Angeles harbor area to Santa Fe Springs.

1972 - Contract with City of Long Beach for production of Parcel "A" in the Wilmington Field.

1974 - Added new crude unit to refiner - almost doubling capacity.

1976 - Added Barbers Point Terminal - State of Hawaii.

1980 - Started heavy oil upgrading project.

1982 - Completed heavy oil upgrading project.

1984 - Filed for Chapter 11 bankruptcy.

EXHIBIT 2

POWERINE Oil Company

12354 Lakeland Road, P. O. Box 2108
Santa Fe Springs, Calif. 90670-9883

(213) 944-9861
(213) 944-6111

The West's Largest Independent Refinery And Marketing Chain

December 20, 1984

Hazardous Substance Storage Statement
State Water Resources Control Board
P. O. Box 100
Sacramento, California 95801-0100

Dear Sir:

Forwarded are five Hazardous Substance Storage Statements and a $50.00 check for registration fees on the following items:

East Alky Neutralization Pit
West Alky Neutralization Pit
Premium Gasoline Tank - 868253
Unleaded Gasoline Tank - 868254
Regular Gasoline Tank - 868257

Please call if you have any questions.

Very truly yours,

W. J. Ziemba
Coordinator of Environmental Affairs

WJZ:jp

Encl.

cc: Henry Del Castillo
Jim L. Farragh

Official Registration Form

California Water Resources Control Board

Hazardous Substance Storage Statement

Who Must File: Each person storing hazardous substances in any underground container must file this form no later than July 1, 1984 (After October 1, 1984 and no later than January 1, 1985 for tanks used on farms)

Definition of Underground Containers: The law applies to "concrete sumps, nonvaulted buried tanks or other underground containers" (Water Code section 13173). All containers including earthen walled pits, ponds lagoons and sumps that are below the normal ground surface level must register. A tank sitting on the ground is not included. Containers partially beneath the surface are included. Lined or unlined pits, ponds and lagoons are covered if earth has been removed from the storage area to construct the facility. Normal grading is not considered construction below ground level.

Definition of Hazardous Substance: Any substance listed in Section 6382 of the Labor Code or in Section 25316 of the Health and Safety Code. This includes gasoline, diesel fuel, all industrial solvents, pesticides, herbicides and fumigants. If the material must be carried by a registered hauler, disposed of at a hazardous waste site, is explosive, generates pressure due to heat or decomposition or would harm humans or wildlife you must register the tank. Wastes are included.

Fee: For each tank registered a $10 fee must be paid except that retail gasoline stations pay $5 per tank.

Penalties: For failure to file the penalty is $500-$5,000 per day. If you falsify information you can be fined up to $20,000 for each day the information is incorrect and has not been corrected.

Confidentiality: If you have information protected by trade secret laws please attach a list of the information on this form that is confidential and the justification for confidentiality including specific citations of relevant statutory and case law.

Multiple Containers: Fill I and II on one form and leave it blank on all the remaining forms. Attach all forms together securely. If you own more than 50 tanks you can file information on computer tape. Call 916 324-1262 for information.

This is not a Permit Application. All Underground Tanks will be subject to local regulation. Some jurisdictions have already begun programs. Check with your local county government for further information.

NOTE: ALL UNDERGROUND CONTAINERS MUST REGISTER EVEN IF STATE AND/OR LOCAL PERMITS ARE IN FORCE.

I Owner

Name (Corporation, Individual or Public Agency)			
POWERINE OIL COMPANY			
Street Address	City	State	ZIP
12354 LAKELAND ROAD	SANTA FE SPGS.	CA.	90670

II Facility

Facility Name	Dealer, Foreman, Supervisor	
POWERINE OIL COMPANY	SHIFT SUPERVISOR	
Street Address		Nearest Cross Street
12354 LAKELAND ROAD		NORWALK BLVD
City	County	ZIP
SANTE FE SPGS.	LOS ANGELES	90670
Mailing Address	City	State / ZIP
12354 LAKELAND ROAD	SANTA FE SPGS.	CA. 90670
Phone w/ area code	Type of Business	
(213) 944-6111	☐ 01 Motor Vehicle Fuel Station ☑ 02 Other: PETROL. REFINER	
Number of Tanks at this Facility	Rural Areas Only: Township / Range / Section	
5		

III 24 Hour Emergency Contact Person

Days: Name (last name first) and Phone w/ area code	Nights: Name (last name first) and Phone w/ area code
SHIFT SUPERVISOR (213) 944-6111	SHIFT SUPERVISOR (213) 944-6111

COMPLETE THE FOLLOWING ON A SEPARATE FORM FOR EACH CONTAINER

IV Description

A. ☐ 01 Tank ☐ 02 Sump ☑ 03 Lagoon, Pit or Pond ☐ 04 Other: _____ Container Number (if there is no number, assign one): EAST

B. Manufacturer (if appropriate): UNK. Year of Mfg.: 1968 C. Year Installed: 1968 ☐ Unknown

D. Container Capacity: _____ gallons ☑ Unknown E. Container Repairs: ☐ 01 None ☑ 02 Unknown ☐ 03 Yes Year: _____

F. Is Container currently used? ☐ 01 Yes ☑ 02 No If No, year of last use: 1984 ☐ 03 Unknown

G. Does the Container Store (Check One): ☑ 01 Waste ☐ 02 Product

H. Does the Container Store Motor Vehicle Fuel or Waste Oil? ☐ 01 Yes ☑ 02 No If Yes, Check appropriate box(es).

☐ 01 Unleaded ☐ 02 Regular ☐ 03 Premium ☐ 04 Diesel ☐ 05 Waste Oil ☐ 06 Other (List): _____

V Container Construction

A. Thickness of Primary Containment: 9 ☐ Gauge ☑ Inches ☐ cm ☐ Unknown

B. ☐ 01 Vaulted (Located in an underground Vault.) ☐ 02 Non-vaulted ☑ 03 Unknown

C. ☐ 01 Double Walled ☐ 02 Single Walled ☐ 03 Lined ☐ 04 Wrapped ☑ 05 Unknown ☐ 06 None

D. ☐ 01 Carbon Steel ☐ 02 Stainless Steel ☐ 03 Fiberglass ☐ 04 Polyvinyl Chloride ☑ 05 Concrete ☐ 06 Aluminum

☐ 07 Steel Clad ☐ 08 Bronze ☐ 09 Composite ☐ 10 Non-metallic ☐ 11 Earthen Walls

☐ 12 Unknown ☐ 13 Other: _____

E. ☐ 01 Rubber Lined ☐ 02 Alkyd Lining ☐ 03 Epoxy Lining ☐ 04 Phenolic Lining ☐ 05 Glass Lining ☐ 06 Clay Lining

☐ 07 Unlined ☑ 08 Unknown ☐ 09 Other _____

VI Piping

A Associated Piping	☑ Above Ground	☐ Underground	☐ Vaulted	
B Underground Piping	☐ Gravity	☐ Pressure	☐ Suction	☑ Unknown
C Piping Repairs	☐ None	☑ Unknown	☐ Yes Year of most recent repair	

VII Leak Detection

☐ Visual ☐ Stock Inventory ☐ Tile Drain ☐ Vapor Shift Wells ☐ Sensor Instrument

☐ Ground Water Monitoring Wells ☐ Pressure Test ☐ Internal Inspection ☑ None

☐ Other

VIII Chemical Composition of Materials *Currently* or *Previously* Stored in Underground Containers

If you checked yes to IV-H you are not required to complete this section

currently stored	previously stored	CAS # (if known)	Chemical Do Not Use Commercial Name (Use additional paper for more room)
☐ 01	☑ 02		CALCIUM OXIDE SLURRY
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		

Is Container located on an Agricultural Farm? ☐ Yes ☑ No

IX IMPORTANT! Read instructions before signing:

Signature: The form must be signed by 1) a principal executive officer at the level of vice-president or by an authorized representative. The representative must be responsible for the overall operation of the facility where the tank(s) are located 2) a general partner proprietor or 3) a principal executive officer ranking elected official or authorized representative of a public agency.

This form has been completed under the penalty of perjury and, to the best of my knowledge, is true and correct.

Signature		Date
Henry Del Castillo		DEC 20, 1984
Printed Name	**Title**	**Phone w area code**
HENRY DEL CASTILLO	REF. GEN. MGR.	(213) 944-6111

Send check to: Hazardous Substance Storage Statement State Water Resources Control Board, P.O. Box 100, Sacramento, CA 95801-0100

Person Filing Statement	Phone w area code
W.J. ZIEMBA	(213) 944-6111

For additional forms or more information call 916/324-1262

FOR STATE USE ONLY

ID Number	Accounting Number	County Number	
Date Received	☐ 01	☐ 02	☐ 03

Official Registration Form

California Water Resources Control Board

Hazardous Substance Storage Statement

Who Must File: Each person storing hazardous substances in any underground container must file this form no later than July 1, 1984 (After October 1, 1984 and no later than January 1, 1985 for tanks used on farms)

Definition of Underground Containers: The law applies to "concrete sumps, nonvaulted buried tanks or other underground containers." (Water Code section 13173) All containers including earthen walled pits, ponds, lagoons and sumps, that are below the normal ground surface level must register. A tank sitting on the ground is not included. Containers partially beneath the surface are included. Lined or unlined pits, ponds and lagoons are covered if earth has been removed from the storage area to construct the facility. Normal grading is not considered construction below ground level.

Definition of Hazardous Substance: Any substance listed in Section 6382 of the Labor Code or in Section 25316 of the Health and Safety Code. This includes gasoline, diesel fuel, all industrial solvents, pesticides, herbicides and fumigants. If the material must be carried by a registered hauler, disposed of at a hazardous waste site, is explosive, generates pressure due to heat or decomposition or would harm humans or wildlife, you must register the tank. Wastes are included.

Fee: For each tank registered a $10 fee must be paid, except that retail gasoline stations pay $5 per tank.

Penalties: For failure to file the penalty is $500-$5,000 per day. If you falsify information you can be fined up to $20,000 for each day the information is incorrect and has not been corrected.

Confidentiality: If you have information protected by trade secret laws please attach a list of the information on this form that is confidential and the justification for confidentiality, including specific citations of relevant statutory and case law.

Multiple Containers: Fill I and II on one form and leave it blank on all the remaining forms. Attach all forms together securely. If you own more than 50 tanks you can file information on computer tape. Call 916/324-1262 for information.

This is not a Permit Application. All Underground Tanks will be subject to local regulation. Some jurisdictions have already begun programs. Check with your local county government for further information.

NOTE: ALL UNDERGROUND CONTAINERS MUST REGISTER EVEN IF STATE AND/OR LOCAL PERMITS ARE IN FORCE.

I Owner

Name (Corporation, Individual or Public Agency)			
Street Address	City	State	ZIP

II Facility

Facility Name		Dealer, Foreman, Supervisor	
Street Address		Nearest Cross Street	
City		County	ZIP
Mailing Address		City	State / ZIP
Phone w/ area code	Type of Business: ☐ 01 Motor Vehicle Fuel Station ☐ 02 Other:		
Number of Tanks at this Facility	**Rural Areas Only:** Township	Range	Section

III 24 Hour Emergency Contact Person

Days: Name (last name first) and Phone w/ area code	Nights: Name (last name first) and Phone w/ area code

COMPLETE THE FOLLOWING ON A SEPARATE FORM FOR EACH CONTAINER

IV Description

A. ☐ 01 Tank ☐ 02 Sump ☑ 03 Lagoon, Pit or Pond ☐ 04 Other: _____ Container Number (if there is no number, assign one): WEST

B. Manufacturer (if appropriate): UNK Year of Mfg: 1968 C. Year Installed: 1968 ☐ Unknown

D. Container Capacity: _____ gallons ☑ Unknown E. Container Repairs: ☐ 01 None ☑ 02 Unknown ☐ 03 Yes Year: _____

F. Is Container currently used? ☐ 01 Yes ☑ 02 No If No, year of last use: 1984 ☐ 03 Unknown

G. Does the Container Store (Check One): ☑ 01 Waste ☐ 02 Product

H. Does the Container Store Motor Vehicle Fuel or Waste Oil? ☐ 01 Yes ☑ 02 No If Yes, Check appropriate box(es):

☐ 01 Unleaded ☐ 02 Regular ☐ 03 Premium ☐ 04 Diesel ☐ 05 Waste Oil ☐ 06 Other (List): _____

V Container Construction

A. Thickness of Primary Containment: 8 ☐ Gauge ☑ Inches ☐ cm ☐ Unknown

B. ☐ 01 Vaulted (Located in an underground Vault) ☐ 02 Non-vaulted ☑ 03 Unknown

C. ☐ 01 Double Walled ☐ 02 Single Walled ☐ 03 Lined ☐ 04 Wrapped ☑ 05 Unknown ☐ 06 None

D ☐ 01 Carbon Steel ☐ 02 Stainless Steel ☐ 03 Fiberglass ☐ 04 Polyvinyl Chloride ☑ 05 Concrete ☐ 06 Aluminum

☐ 07 Steel Clad ☐ 08 Bronze ☐ 09 Composite ☐ 10 Non-metallic ☐ 11 Earthen Walls

☐ 12 Unknown ☐ 13 Other: _____

E ☐ 01 Rubber Lined ☐ 02 Alkyd Lining ☐ 03 Epoxy Lining ☐ 04 Phenolic Lining ☐ 05 Glass Lining ☐ 06 Clay Lining

☐ 07 Unlined ☑ 08 Unknown ☐ 09 Other _____

VI Piping

A Associated Piping	☑ Above Ground	☐ Underground	☐ Vaulted	
B Underground Piping:	☐ Gravity	☐ Pressure	☐ Suction	☑ Unknown
C Piping Repairs:	☐ None	☑ Unknown	☐ Yes Year of most recent repair	_____

VII Leak Detection

☐ Visual ☐ Stock Inventory ☐ Tile Drain ☐ Vapor Shift Wells ☐ Sensor Instrument

☐ Ground Water Monitoring Wells ☐ Pressure Test ☐ Internal Inspection ☑ None

☐ Other _____

VIII Chemical Composition of Materials *Currently* or *Previously* Stored in Underground Containers

If you checked yes to IV-H you are not required to complete this section

currently	previously	CAS # (if known)	Chemical Do Not Use Commercial Name (Use additional paper for more room)
☐ 01	☑ 02		CALCIUM OXIDE SLURRY
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		

Is Container located on an Agricultural Farm? ☐ Yes ☑ No

IX IMPORTANT! Read instructions before signing

Signature: The form must be signed by 1) a principal executive officer at the level of vice-president or by an authorized representative. The representative must be responsible for the overall operation of the facility where the tank(s) are located 2) a general partner proprietor or 3) a principal executive officer ranking elected official or authorized representative of a public agency.

This form has been completed under the penalty of perjury and, to the best of my knowledge, is true and correct.

Signature		Date
		DEC. 20, 1984
Printed Name	**Title**	**Phone # area code**
HENRY DEL CASTILLO	REF. GEN. MGR.	(213) 944-6111

Send check to: Hazardous Substance Storage Statement, State Water Resources Control Board, P.O. Box 100, Sacramento, CA 95801-0100

Person Filing Statement	Phone # area code
W. J. ZIEMBA	(213) 944-6111

For additional forms or more information call 916/324-1262

FOR STATE USE ONLY

ID Number	Accounting Number	County Number

Date Received	☐ 01	☐ 02	☐ 03

84 31697

Official Registration Form

California Water Resources Control Board

Hazardous Substance Storage Statement

Who Must File: Each person storing hazardous substances in any underground container must file this form no later than July 1 1984 (After October 1 1984 and no later than January 1 1985 for tanks used on farms)

Definition of Underground Containers: The law applies to "concrete sumps nonvaulted buried tanks or other underground containers" (Water Code section 13173) All containers including earthen walled pits ponds lagoons and sumps that are below the normal ground surface level must register A tank sitting on the ground is not included Containers partially beneath the surface are included Lined or unlined pits ponds and lagoons are covered if earth has been removed from the storage area to construct the facility Normal grading is not considered construction below ground level

Definition of Hazardous Substance: Any substance listed in Section 6382 of the Labor Code or in Section 25316 of the Health and Safety Code This includes gasoline diesel fuel all industrial solvents pesticides herbicides and fumigants If the material must be carried by a registered hauler disposed of at a hazardous waste site is explosive generates pressure due to heat or decomposition or would harm humans or wildlife you must register the tank Wastes are included

Fee: For each tank registered a $10 fee must be paid except that retail gasoline stations pay $5 per tank

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Multiple Containers: Fill I and II on one form and leave it blank on all the remaining forms Attach all forms together securely If you own more than 50 tanks you can file information on computer tape Call 916 324-1262 for information

This is not a Permit Application. All Underground Tanks will be subject to local regulation Some jurisdictions have already begun programs Check with your local county government for further information

NOTE: ALL UNDERGROUND CONTAINERS MUST REGISTER EVEN IF STATE AND/OR LOCAL PERMITS ARE IN FORCE.

I Owner

Name (Corporation Individual or Public Agency)			
Street Address	City	State	ZIP

II Facility

Facility Name		Dealer Foreman Supervisor	
Street Address			Nearest Cross Street
City		County	ZIP
Mailing Address		City	State ZIP
Phone w area code	Type of Business ☐ 01 Motor Vehicle Fuel Station ☐ 02 Other:		
Number of Tanks at this Facility	Rural Areas Only: Township	Range	Section

III 24 Hour Emergency Contact Person

Days Name (last name first) and Phone w area code	Nights Name (last name first) and Phone w area code

COMPLETE THE FOLLOWING ON A SEPARATE FORM FOR EACH CONTAINER

IV Description

A. ☑ 01 Tank ☐ 02 Sump ☐ 03 Lagoon, Pit or Pond ☐ 04 Other: _____ Container Number (if there is no number assign one) 868253

B. Manufacturer (if appropriate): UNK. Year of Mfg: UNK. C. Year Installed: 1976 ☐ Unknown

D. Container Capacity: 8112 gallons ☐ Unknown E. Container Repairs: ☐ 01 None ☑ 02 Unknown ☐ 03 Yes Year: _____

F. Is Container currently used? ☑ 01 Yes ☐ 02 No If No, year of last use: _____ ☐ 03 Unknown

G. Does the Container Store (Check One): ☐ 01 Waste ☑ 02 Product

H. Does the Container Store Motor Vehicle Fuel or Waste Oil? ☑ 01 Yes ☐ 02 No If Yes, Check appropriate box(es):

☐ 01 Unleaded ☐ 02 Regular ☑ 03 Premium ☐ 04 Diesel ☐ 05 Waste Oil ☐ 06 Other (List): _____

V Container Construction

A. Thickness of Primary Containment: _____ ☐ Gauge ☐ Inches ☐ cm ☑ Unknown

B ☐ 01 Vaulted (Located in an underground Vault) ☐ 02 Non-vaulted ☑ 03 Unknown

C ☐ 01 Double Walled ☐ 02 Single Walled ☐ 03 Lined ☐ 04 Wrapped ☑ 05 Unknown ☐ 06 None

D ☐ 01 Carbon Steel ☐ 02 Stainless Steel ☐ 03 Fiberglass ☐ 04 Polyvinyl Chloride ☐ 05 Concrete ☐ 06 Aluminum

☐ 07 Steel Clad ☐ 08 Bronze ☐ 09 Composite ☐ 10 Non-metallic ☐ 11 Earthen Walls

☑ 12 Unknown ☐ 13 Other: _____

E ☐ 01 Rubber Lined ☐ 02 Alkyd Lining ☐ 03 Epoxy Lining ☐ 04 Phenolic Lining ☐ 05 Glass Lining ☐ 06 Clay Lining

☐ 07 Unlined ☑ 08 Unknown ☐ 09 Other: _____

F ☐ 01 Polyethlene Wrap ☐ 02 Vinyl Wrapping ☐ 03 Cathodic Protection ☑ 04 Unknown ☐ 05 None ☐ 06 Other _____

VI Piping

A. Associated Piping:	☐ 01 Above Ground	☑ 02 Underground	☐ 03 Vaulted
B. Underground Piping:	☑ 01 Gravity	☐ 02 Pressure	☑ 03 Suction ☐ 04 Unknown
C. Piping Repairs:	☐ 01 None	☑ 02 Unknown	☐ 03 Yes. Year of most recent repair: _____

VII Leak Detection

☐ 01 Visual ☐ 02 Stock Inventory ☐ 03 Tile Drain ☐ 04 Vapor Shall Wells ☐ 05 Sensor Instrument

☐ 06 Ground Water Monitoring Wells ☐ 07 Pressure Test ☐ 08 Internal Inspection ☑ 09 None

☐ 10 Other: _____

VIII Chemical Composition of Materials *Currently* or *Previously* Stored in Underground Containers

If you checked yes to IV-H you are not required to complete this section

currently stored	previously stored	CAS number (if known)	Chemical (Do Not Use Commercial Name) (Use additional paper for more room)
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		

Is Container located on an Agricultural Farm? ☐ 01 Yes ☑ 02 No

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This form has been completed under the penalty of perjury and, to the best of my knowledge, is true and correct.

Signature		Date
Henry Del Castillo		DEC 20, 1984
Printed Name	**Title**	**Phone w. area code**
HENRY DEL CASTILLO	REF. GEN. MGR.	(213) 944-6111

Send check to: Hazardous Substance Storage Statement, State Water Resources Control Board, P.O. Box 100, Sacramento, CA 95801-0100

Person Filing Statement	Phone w. area code
W.J. ZIEMBA	(213) 944-6111

For additional forms or more information call 916/324-1262

FOR STATE USE ONLY

ID Number	Accounting Number	County Number

Date Received	☐ 01	☐ 02	☐ 03

84 31697

Official Registration Form

California Water Resources Control Board

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I Owner

Name (Corporation, Individual or Public Agency)			
Street Address	City	State	ZIP

II Facility

Facility Name		Dealer, Foreman, Supervisor	
Street Address		Nearest Cross Street	
City	County		ZIP
Mailing Address	City	State	ZIP
Phone w/ area code	Type of Business: ☐ 01 Motor Vehicle Fuel Station ☐ 02 Other:		
Number of Tanks at this Facility	**Rural Areas Only:** Township	Range	Section

III 24 Hour Emergency Contact Person

Days: Name (last name first) and Phone w/ area code	Nights: Name (last name first) and Phone w/ area code

COMPLETE THE FOLLOWING ON A SEPARATE FORM FOR EACH CONTAINER

IV Description

A. ☑ 01 Tank ☐ 02 Sump ☐ 03 Lagoon, Pit or Pond ☐ 04 Other: _____ Container Number (if there is no number, assign one): 868254

B. Manufacturer (if appropriate): UNK Year of Mfg: UNK C. Year Installed: 1976 ☐ Unknown

D. Container Capacity: 8112 gallons ☐ Unknown E. Container Repairs: ☐ 01 None ☑ 02 Unknown ☐ 03 Yes Year: _____

F. Is Container currently used? ☑ 01 Yes ☐ 02 No If No, year of last use: _____ ☐ 03 Unknown

G. Does the Container Store (Check One): ☐ 01 Waste ☑ 02 Product

H. Does the Container Store Motor Vehicle Fuel or Waste Oil? ☐ 01 Yes ☐ 02 No If Yes, Check appropriate box(es):

☑ 01 Unleaded ☐ 02 Regular ☐ 03 Premium ☐ 04 Diesel ☐ 05 Waste Oil ☐ 06 Other (List): _____

V Container Construction

A. Thickness of Primary Containment: _____ ☐ Gauge ☐ Inches ☐ cm ☑ Unknown

B. ☐ 01 Vaulted (Located in an underground Vault.) ☐ 02 Non-vaulted ☑ 03 Unknown

C. ☐ 01 Double Walled ☐ 02 Single Walled ☐ 03 Lined ☐ 04 Wrapped ☑ 05 Unknown ☐ 06 None

D. ☐ 01 Carbon Steel ☐ 02 Stainless Steel ☐ 03 Fiberglass ☐ 04 Polyvinyl Chloride ☐ 05 Concrete ☐ 06 Aluminum

☐ 07 Steel Clad ☐ 08 Bronze ☐ 09 Composite ☐ 10 Non-metallic ☐ 11 Earthen Walls

☑ 12 Unknown ☐ 13 Other: _____

E. ☐ 01 Rubber Lined ☐ 02 Alkyd Lining ☐ 03 Epoxy Lining ☐ 04 Phenolic Lining ☐ 05 Glass Lining ☐ 06 Clay Lining

☐ 07 Unlined ☑ 08 Unknown ☐ 09 Other: _____

F. ☐ 01 Polyethlene Wrap ☐ 02 Vinyl Wrapping ☐ 03 Cathodic Protection ☑ 04 Unknown ☐ 05 None ☐ 06 Other _____

VI Piping

A. Associated Piping:	☐ 1 Above Ground	☑ 2 Underground	☐ 3 Vaulted
B. Underground Piping:	☑ Gravity	☐ 2 Pressure	☑ Suction ☐ 4 Unknown
C. Piping Repairs	☐ 1 None	☑ Unknown	☐ 3 Yes. Year of most recent repair. _____

VII Leak Detection

☐ 1 Visual ☐ 2 Stock Inventory ☐ 3 Tile Drain ☐ 4 Vapor Sniff Wells ☐ 5 Sensor Instrument

☐ 6 Ground Water Monitoring Wells ☐ 7 Pressure Test ☐ 8 Internal Inspection ☑ 9 None

☐ 10 Other _____

VIII Chemical Composition of Materials *Currently or Previously* Stored in Underground Containers

If you checked yes to IV-H you are not required to complete this section

currently stored	previously stored	CAS # (if known)	Chemical Do Not Use Commercial Name (Use additional paper for more room)
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		

Is Container located on an Agricultural Farm? ☐ 1 Yes ☑ 2 No

IX IMPORTANT! Read instructions before signing:

Signature: The form must be signed by 1) a principal executive officer at the level of vice-president or by an authorized representative. The representative must be responsible for the overall operation of the facility where the tank(s) are located 2) a general partner proprietor or 3) a principal executive officer ranking elected official or authorized representative of a public agency.

This form has been completed under the penalty of perjury and, to the best of my knowledge, is true and correct.

Signature		Date
Kenny Del Castillo		DEC. 20, 1984
Printed Name	**Title**	**Phone w. area code**
HENRY DEL CASTILLO	REF. GEN. MGR.	(213) 944-6111

Send check to: Hazardous Substance Storage Statement, State Water Resources Control Board, P.O. Box 100, Sacramento, CA 95801-0100

Person Filing Statement	Phone w. area code
W. J. ZIEMBA	(213) 944-6111

For additional forms or more information call 916/324-1262

FOR STATE USE ONLY

ID Number	Accounting Number	County Number

Date Received	☐ 01	☐ 02	Cat.

Official Registration Form

California Water Resources Control Board

Hazardous Substance Storage Statement

Who Must File: Each person storing hazardous substances in any underground container must file this form no later than July 1, 1984 (After October 1, 1984 and no later than January 1, 1985 for tanks used on farms)

Definition of Underground Containers: The law applies to concrete sumps, nonvaulted buried tanks or other underground containers. (Water Code section 13173). All containers including earthen walled pits, ponds, lagoons and sumps that are below the normal ground surface level must register. A tank sitting on the ground is not included. Containers partially beneath the surface are included. Lined or unlined pits, ponds and lagoons are covered if earth has been removed from the storage area to construct the facility. Normal grading is not considered construction below ground level.

Definition of Hazardous Substance: Any substance listed in Section 6382 of the Labor Code or in Section 25316 of the Health and Safety Code. This includes gasoline, diesel fuel, all industrial solvents, pesticides, herbicides and fumigants. If the material must be carried by a registered hauler, disposed of at a hazardous waste site, is explosive, generates pressure due to heat or decomposition, or would harm humans or wildlife you must register the tank. Wastes are included.

Fee: For each tank registered a $10 fee must be paid, except that retail gasoline stations pay $5 per tank.

Penalties: For failure to file, the penalty is $500-$5,000 per day. If you falsify information, you can be fined up to $20,000 for each day the information is incorrect and has not been corrected.

Confidentiality: If you have information protected by trade secret laws, please attach a list of the information on this form that is confidential and the justification for confidentiality, including specific citations of relevant statutory and case law.

Multiple Containers: Fill I and II on one form and leave it blank on all the remaining forms. Attach all forms together securely. If you own more than 50 tanks you can file information on computer tape. Call 916/324-1062 for information.

This is not a Permit Application. All Underground Tanks will be subject to local regulation. Some jurisdictions have already begun programs. Check with your local county government for further information.

NOTE: ALL UNDERGROUND CONTAINERS MUST REGISTER EVEN IF STATE AND/OR LOCAL PERMITS ARE IN FORCE.

I Owner

Name (Corporation, Individual or Public Agency)			
Street Address	City	State	ZIP

II Facility

Facility Name		Dealer, Foreman, Supervisor	
Street Address		Nearest Cross Street	
City	County		ZIP
Mailing Address	City	State	ZIP
Phone w/ area code	Type of Business: ☐ 01 Motor Vehicle Fuel Station ☐ 02 Other:		
Number of Tanks at this Facility	**Rural Areas Only:** Township	Range	Section

III 24 Hour Emergency Contact Person

Days: Name (last name first) and Phone w/ area code	Nights: Name (last name first) and Phone w/ area code

COMPLETE THE FOLLOWING ON A SEPARATE FORM FOR EACH CONTAINER

IV Description

A. ☑ 01 Tank ☐ 02 Sump ☐ 03 Lagoon, Pit or Pond ☐ 04 Other: _____ Container Number (if there is no number, assign one): 868257

B. Manufacturer (if appropriate): UNK Year of Mfg: UNK C. Year Installed: 1976 ☐ Unknown

D. Container Capacity: 8112 gallons ☐ Unknown E. Container Repairs: ☐ 01 None ☑ 02 Unknown ☐ 03 Yes Year: _____

F. Is Container currently used? ☑ 01 Yes ☐ 02 No If No, year of last use: _____ ☐ 03 Unknown

G. Does the Container Store (Check One): ☐ 01 Waste ☑ 02 Product

H. Does the Container Store Motor Vehicle Fuel or Waste Oil? ☐ 01 Yes ☐ 02 No If Yes, Check appropriate box(es):

☐ 01 Unleaded ☑ 02 Regular ☐ 03 Premium ☐ 04 Diesel ☐ 05 Waste Oil ☐ 06 Other (List): _____

V Container Construction

A. Thickness of Primary Containment: _____ ☐ Gauge ☐ Inches ☐ cm ☑ Unknown

B. ☐ 01 Vaulted (Located in an underground Vault.) ☐ 02 Non-vaulted ☑ 03 Unknown

C ☐ 01 Double Walled ☐ 02 Single Walled ☐ 03 Lined ☐ 04 Wrapped ☑ 05 Unknown ☐ 06 None

D ☐ 01 Carbon Steel ☐ 02 Stainless Steel ☐ 03 Fiberglass ☐ 04 Polyvinyl Chloride ☐ 05 Concrete ☐ 06 Aluminum

☐ 07 Steel Clad ☐ 08 Bronze ☐ 09 Composite ☐ 10 Non-metallic ☐ 11 Earthen Walls

☑ 12 Unknown ☐ 13 Other: _____

E ☐ 01 Rubber Lined ☐ 02 Alkyd Lining ☐ 03 Epoxy Lining ☐ 04 Phenolic Lining ☐ 05 Glass Lining ☐ 06 Clay Lining

☐ 07 Unlined ☑ 08 Unknown ☐ 09 Other _____

F ☐ 01 Polyethlene Wrap ☐ 02 Vinyl Wrapping ☐ 03 Cathodic Protection ☑ 04 Unknown ☐ 05 None ☐ 06 Other _____

VI Piping

A. Associated Piping:	☐ 01 Above Ground	☑ 02 Underground	☐ 03 Vaulted	
B. Underground Piping:	☑ 01 Gravity	☐ 02 Pressure	☑ 03 Suction	☐ 04 Unknown
C. Piping Repairs:	☐ 01 None	☑ 02 Unknown	☐ 03 Yes. Year of most recent repair: _____	

VII Leak Detection

☐ 01 Visual ☐ 02 Stock Inventory ☐ 03 Tile Drain ☐ 04 Vapor Sniff Wells ☐ 05 Sensor Instrument

☐ 06 Ground Water Monitoring Wells ☐ 07 Pressure Test ☐ 08 Internal Inspection ☑ 09 None

☐ 10 Other: _____

VIII Chemical Composition of Materials *Currently* or *Previously* Stored in Underground Containers

If you checked yes to IV-H you are not required to complete this section

currently stored	previously stored	CAS # (if known)	Chemical (Do Not Use Commercial Name. Use additional paper for more room)
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		
☐ 01	☐ 02		

Is Container located on an Agricultural Farm? ☐ 01 Yes ☑ 02 No

IX IMPORTANT! Read instructions before signing:

Signature: The form must be signed by 1) a principal executive officer at the level of vice-president or by an authorized representative. The representative must be responsible for the overall operation of the facility where the tank(s) are located 2) a general partner proprietor or 3) a principal executive officer ranking elected official or authorized representative of a public agency.

This form has been completed under the penalty of perjury and, to the best of my knowledge, is true and correct.

Signature		Date
Henry Del Castillo		DEC. 20, 1984
Printed Name	**Title**	**Phone w. area code**
HENRY DEL CASTILLO	REF. GEN. MGR.	(213) 944-6111

Send check to: Hazardous Substance Storage Statement, State Water Resources Control Board, P.O. Box 100, Sacramento, CA 95801-0100

Person Filing Statement	Phone w. area code
W. J. ZIEMBA	(213) 944-6111

For additional forms or more information call 916/324-1262

FOR STATE USE ONLY

Tank Number	Accounting Number	County Number
Date Received	☐ 01	☐ 02 ☐ 03

84 31697

EXHIBIT 3

LOGS OF BORINGS

PREPARED BY

FUGRO, INC., CONSULTING ENGINEERS AND
GEOLOGISTS, 1980, FOR GEOTECHNICAL
INVESTIGATION OF THE POWERINE REFINERY SITE
FOR INSTALLATION OF NEW UNITS

E-1 5-78

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	10	Moist	Firm to stiff	Dark gray green	SANDY CLAY (CL); low to medium plasticity, trace gravel, sand size fine
5	S	6				
10	D	11				
15	S	42		Dense to very dense	Dark gray	SILTY SAND (SM), very fine, with trace clay above about 17'
20	D	56				
25	S	48		Dense	Light gray	SAND (SP), fine to medium
30						BORING TERMINATED AT 25.5'
35						
40						

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 9-3-80
EQUIPMENT USED: 8" HOLLOW STEM AUGER
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)
▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-1

10-80

FIGURE A-1

E-1 5-78

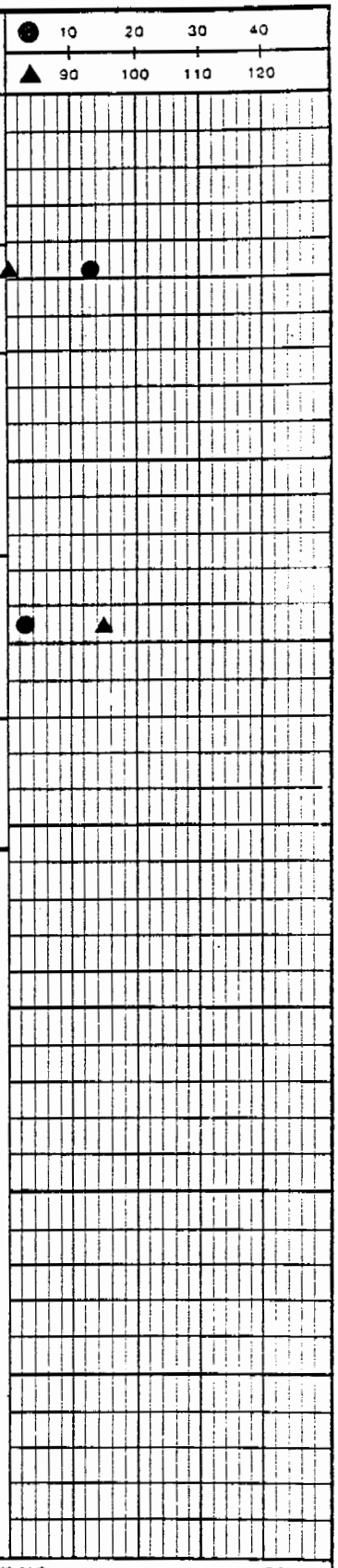
APPROVED BY

CHECKED BY

DRAWN BY

COMPILED BY

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	S	6	Moist	Firm to stiff	Black	SANDY CLAY (CL), oily, possible fill
5	D	8				SANDY CLAY-CLAYEY SAND (CL-SC), oily, possible fill, with wood shreds
				Very stiff	Light brown gray	SILTY SAND-SANDY SILT (SM-ML), non-plastic
10	S	32				
			Dry	Medium dense	Gray	SAND (SP), fine
15	D	23				
					Dark brown	SILTY SAND-CLAYEY SAND (SM-SC), fine sand, low plasticity
20	S	28				
						BORING TERMINATED AT 20.5'
25						
30						
35						
40						



ELEVATION:

DATE DRILLED: 9-3-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-2

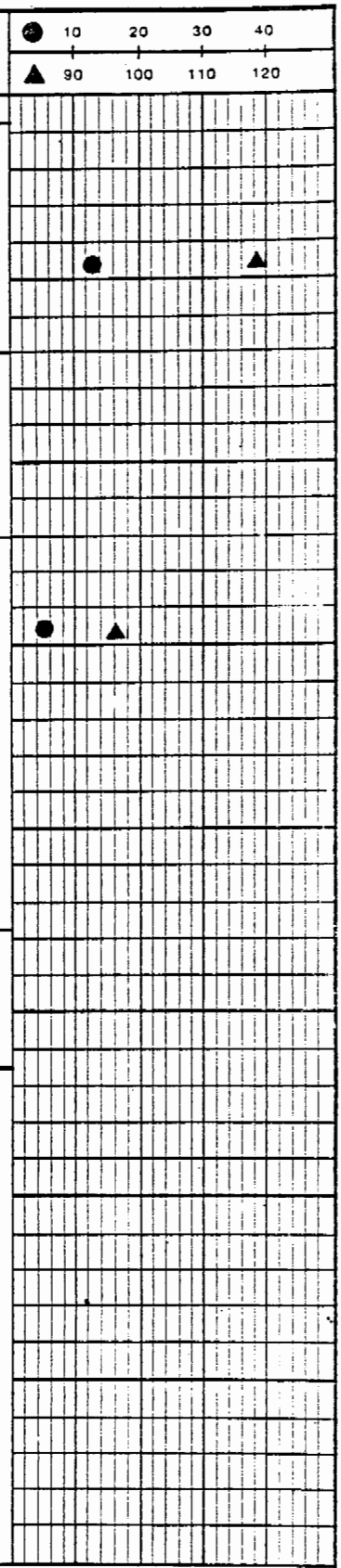
10-80

FIGURE A-2

E-1 5-78

DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ COMPILED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff	Dark	4" gravel at surface SILTY CLAY (CL), medium plasticity
	S	26				
	D	36				
5						
				Hard	Light brown	SANDY CLAY (CL), medium plasticity
	S	56/6'				
10						
			Dry	Dense		SAND (SP-SM), fine
	D	42				
15						fine to medium sand
	S	57		Very dense		
20						
					Gray	SAND (SW), fine to coarse, traces of gravel to ¾" recovered
25	S	80				
						BORING TERMINATED AT 26.5'
30						
35						
40						



ELEVATION: DATE DRILLED: 8-29-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

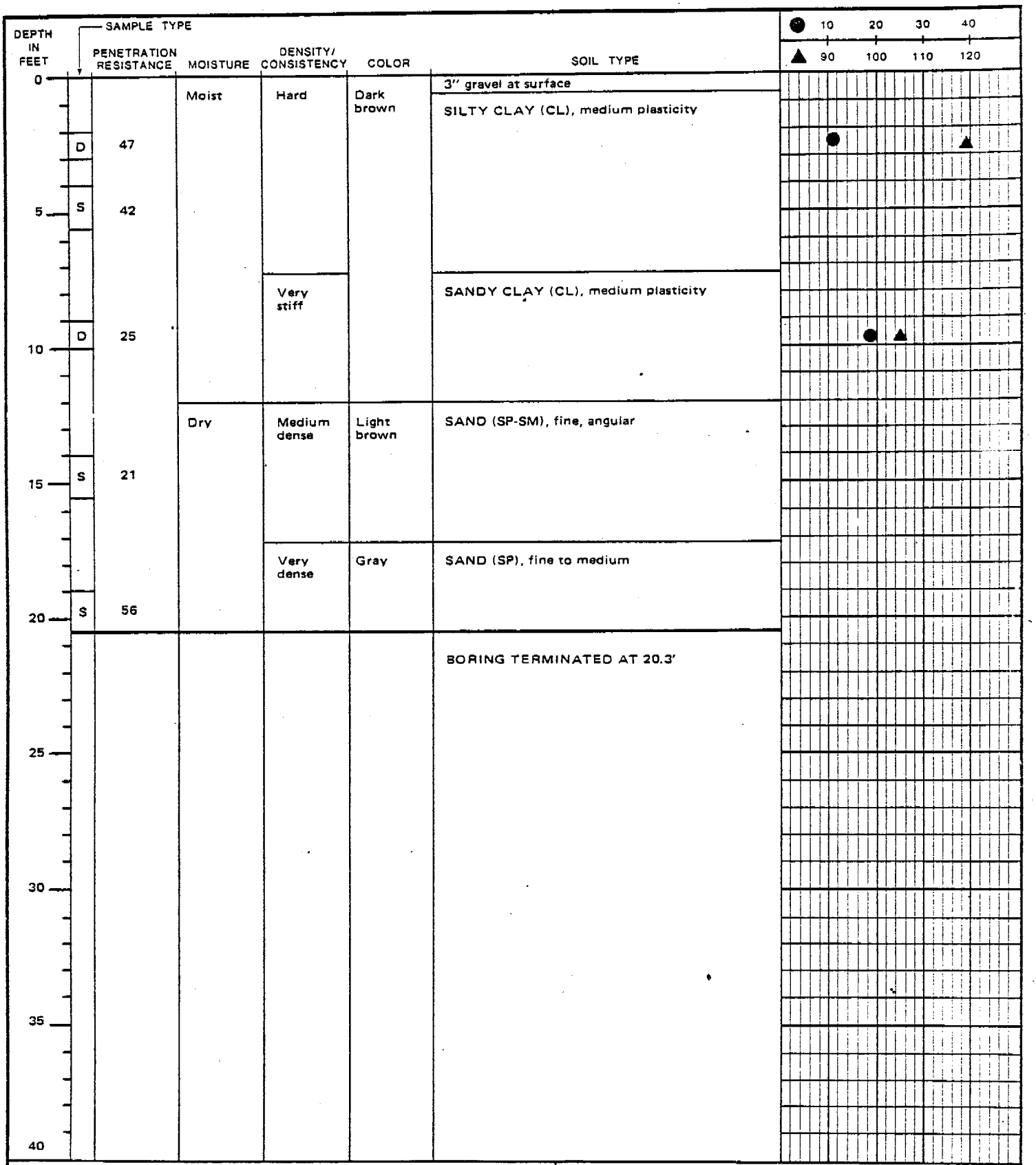
PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-3

10-80

FIGURE A-3



ELEVATION:

DATE DRILLED: 8-29-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-4

10-80

FIGURE A-4

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	17	Moist	Stiff	Dark brown	SANDY CLAY (CL), low plasticity
5	S	52	Dry	Hard		medium plasticity
10	D	57				
15	S	30	Moist	Dense	Light brown	SILTY SAND & SAND (SM & SP-SM), fine, uniform
20	S	39				fine to medium sand
						BORING TERMINATED AT 20.5'

25
30
35
40

● 10 20 30 40
▲ 90 100 110 120

E-1 5-78

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

ELEVATION: DATE DRILLED: 8-29-80
EQUIPMENT USED: 8" HOLLOW STEM AUGER
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-5

10-80

FIGURE A-5

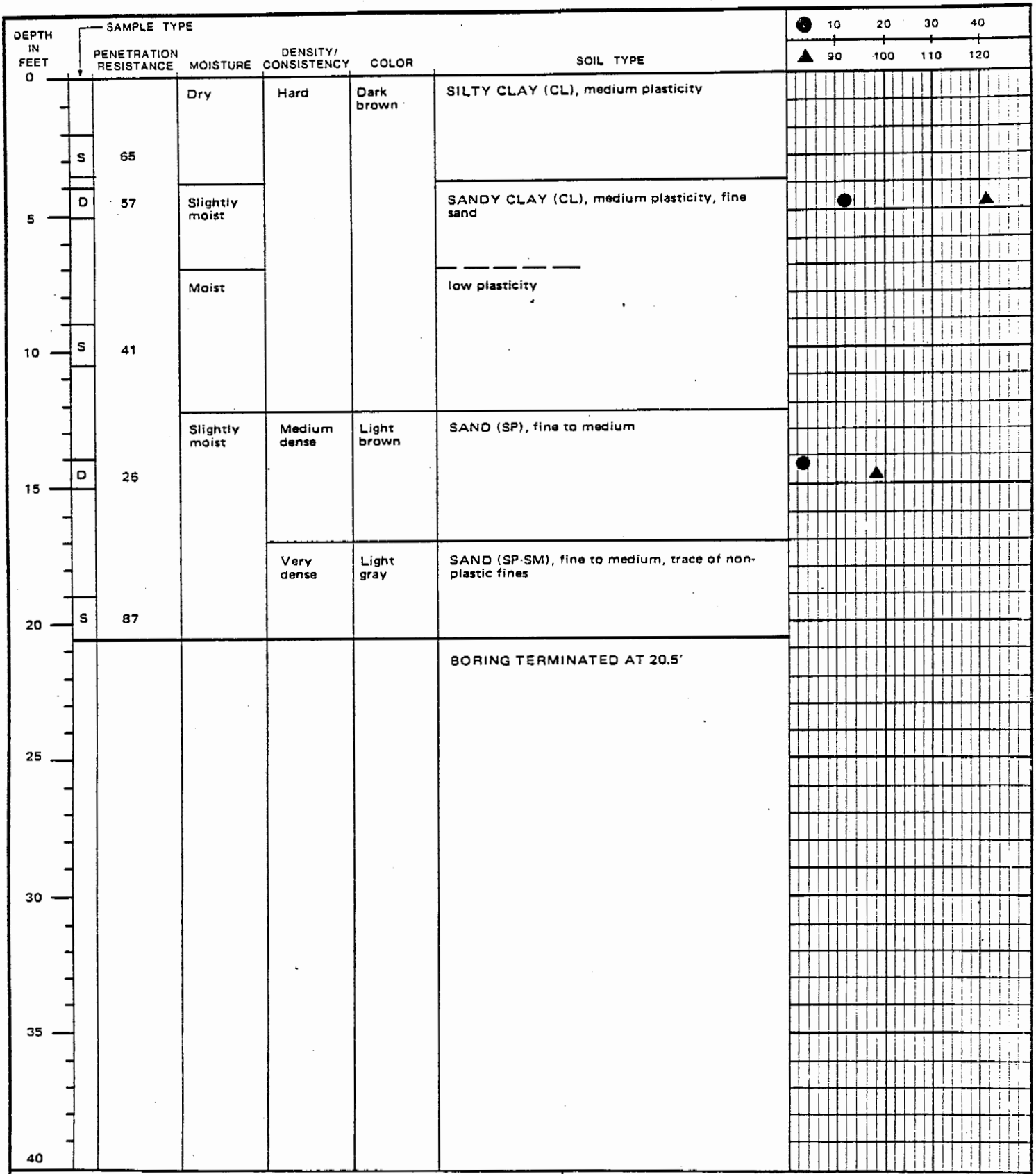
E-1 5-78

APPROVED BY

CHECKED BY

DRAWN BY

COMPILED BY



ELEVATION:

DATE DRILLED: 9-3-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-6

10-80

FIGURE A-6

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Hard	Dark brown	SILTY CLAY (CL), medium plasticity
	S	39				
	D	62				SANDY CLAY (CL), medium plasticity
5						
				Very stiff		low to medium plasticity
10	S	27				
				Medium dense	Light brown	SAND (SP), fine to medium
15	D	23				
				Dense	Gray	SAND (SP-SM), fine, trace of non-plastic fines
20	S	43				
	D	42, NR				
25						BORING TERMINATED AT 25.0'
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

E-1 5-78

APPROVED BY

CHECKED BY

DRAWN BY

COMPILED BY

ELEVATION:

DATE DRILLED: 8-29-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-7

10-80

FIGURE A-7

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
40	D	61	Slightly moist	Very dense	Light brown	SAND (SP-SM), fine with isolated silt (ML) lenses
45	S	63				fine to medium sand
50						BORING TERMINATED AT 49.5'
55						
60						
65						
70						
75						
80						

● 10 20 30 40

▲ 90 100 110 120

ELEVATION:

DATE DRILLED: 8-29-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-8

(SHEET 2 OF 2)

10-80

FIGURE A-8

E-1 5-78

APPROVED BY

CHECKED BY

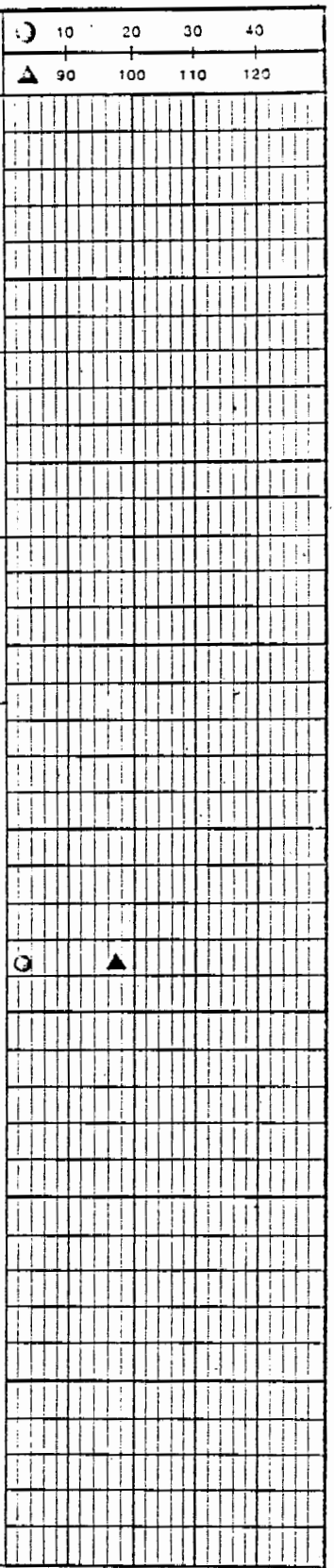
DRAWN BY

COMPILED BY

E-1 5-78

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff	Dark brown	SANDY CLAY (CL), medium plasticity
5	D	20				
			Dry	Hard	Light brown	SILTY SAND-SANDY SILT (SM-ML), no to low plasticity
10	S	37				
				Dense		SAND (SP-SM), fine to medium
15	D	35				
				Very dense	Gray	SAND (SP & SP-SM), fine
20	S	59				
	D	62				
25						
	S	101/11"				
30						
	D	54				
35					Light brown	
	S	57				
40						



ELEVATION:

DATE DRILLED: 8-29-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

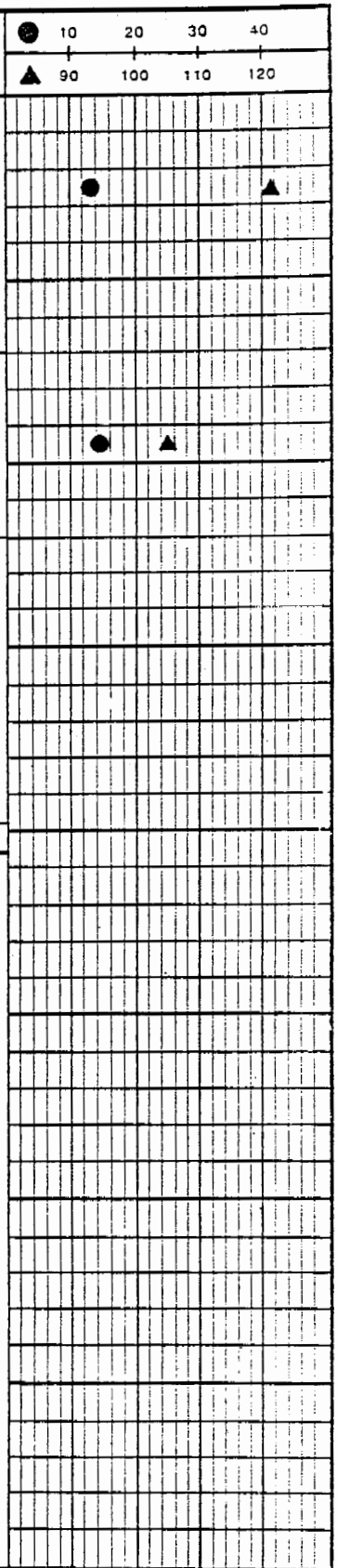
LOG OF BORING NO. A-8

(SHEET 1 OF 2)

10-80

FIGURE A-8

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	70	Moist	Hard	Dark brown	SANDY CLAY (CL), medium plasticity
5	D	75				
				Dense	Gray	SILTY SAND-SANDY SILT (SM-ML), very fine sand
10	D	59				
			Dry		Light brown	SAND (SP-SM), fine to medium
15	S	44				
20	S	45		Hard		SANDY CLAY (CL)
						BORING TERMINATED AT 20.3'
25						
30						
35						
40						



ELEVATION:

DATE DRILLED: 8-29-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[J] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-9

10-80

FIGURE A-9

E-1 5-78

APPROVED BY

CHECKED BY

DRAWN BY

COMPILED BY

E-1 5-78

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	29	Dry	Very stiff	Dark brown	SILTY CLAY (CL), medium to high plasticity
5	S	19				
			Moist	Medium dense	Dark gray	SILTY SAND-SANDY SILT (SM-ML), very fine sand
10	D	27				
			Dry	Dense to very dense	Light brown	SAND (SP-SM), fine to medium
15	S	46				
20	D	64, NR				fine to coarse sand (SP)
25	S	28		Very stiff		SANDY CLAY (CL), medium plasticity at 24.3'
						BORING TERMINATED AT 25.5'
30						
35						
40						

● 10 20 30 40

▲ 90 100 110 120

ELEVATION:

DATE DRILLED: 8-29-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. A-10

10-80

FIGURE A-10

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff to very stiff	Brown	SILTY CLAY (CL); low plasticity
	S	16				
5	D	28				
					Gray	SANDY SILT (ML); low plasticity, fine sand
10				Dense	Light brown	SILTY SAND (SM); fine to medium
	S	47				
						BORING TERMINATED AT 11.5'
15						
20						
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

E-1 6-78

APPROVED BY

CHECKED BY 6-80

DRAWN BY

COMPILED BY

ELEVATION:

DATE DRILLED: 6-3-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO:: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-1

7-80

FIGURE A-

COMPILED BY _____ DRAWN BY L. Nuts 6-80 CHECKED BY _____ APPROVED BY _____ E-1 8-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Hard	Brown	SILTY CLAY (CL); low plasticity, grading with fine sand below 5'
	S	>100				
5	D	>100				
				Medium dense		SILTY SAND (SM); fine
10	S	22				
				Very dense	Gray	SAND (SP); fine to medium, occasional gravel to 3/8"
15	D	75				
20	S	83				
25	D	87				
						BORING TERMINATED AT 26'
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 6-3-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-2

7-80

FIGURE A.2

E-1 5-78

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	S	10	Moist	Firm to stiff	Brown	SILTY CLAY (CL); low plasticity
5	D	8				
10	S	16		Stiff	Gray brown	SANDY SILT (ML); low plasticity, fine sand
15	D	65		Very dense	Gray	SAND (SP); fine to medium
20	S	>100				
25	D	>100				BORING TERMINATED AT 26'
30						
35						
40						

● 10 20 30 40

▲ 90 100 110 120

ELEVATION:

DATE DRILLED: 6-4-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-3

7-80

FIGURE A.3

E-1 5-76

APPROVED BY _____

CHECKED BY 6-80

DRAWN BY _____

COMPILED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	17	Moist	Stiff	Brown	SILTY CLAY (CL); low plasticity
5	S	13				
10	D	18				
15				Medium dense	Gray	SILTY SAND (SM); fine to medium, occasional gravel to 3/8"
	S	18				
20						BORING TERMINATED AT 16.5'
25						
30						
35						
40						

● 10 20 30 40

▲ 90 100 110 120

ELEVATION:

DATE DRILLED: 6-4-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-4

7-80

FIGURE A-4

COMPILED BY _____ DRAWN BY L. Nicks 6-80 CHECKED BY _____ APPROVED BY _____ E-1 6-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Hard	Brown to light brown	SILTY CLAY (CL); low plasticity
	S	75				
5	D	100/5"				
						SANDY SILT (ML); low plasticity
10	S	27		Dense	Light brown	SAND (SP); fine to medium
15	D	73				
						BORING TERMINATED AT 16.0'
20						
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 6-4-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-5

7-80

FIGURE A.5

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	17	Moist	Stiff to very stiff	Red brown	SILTY CLAY (CL); low to medium plasticity
5	S	19			Brown	
10	D	70		Very dense		SILTY SAND (SM); fine
15	S	60				SAND (SP); fine to medium, with coarse
20	D	77			Light brown	
						BORING TERMINATED AT 21.0'
25						
30						
35						
40						

10 20 30 40
90 100 110 120

COMPILED BY _____ DRAWN BY L. Hutz 6-80 CHECKED BY _____ APPROVED BY _____ E-1 6-78

ELEVATION:
DATE DRILLED: 6-2-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

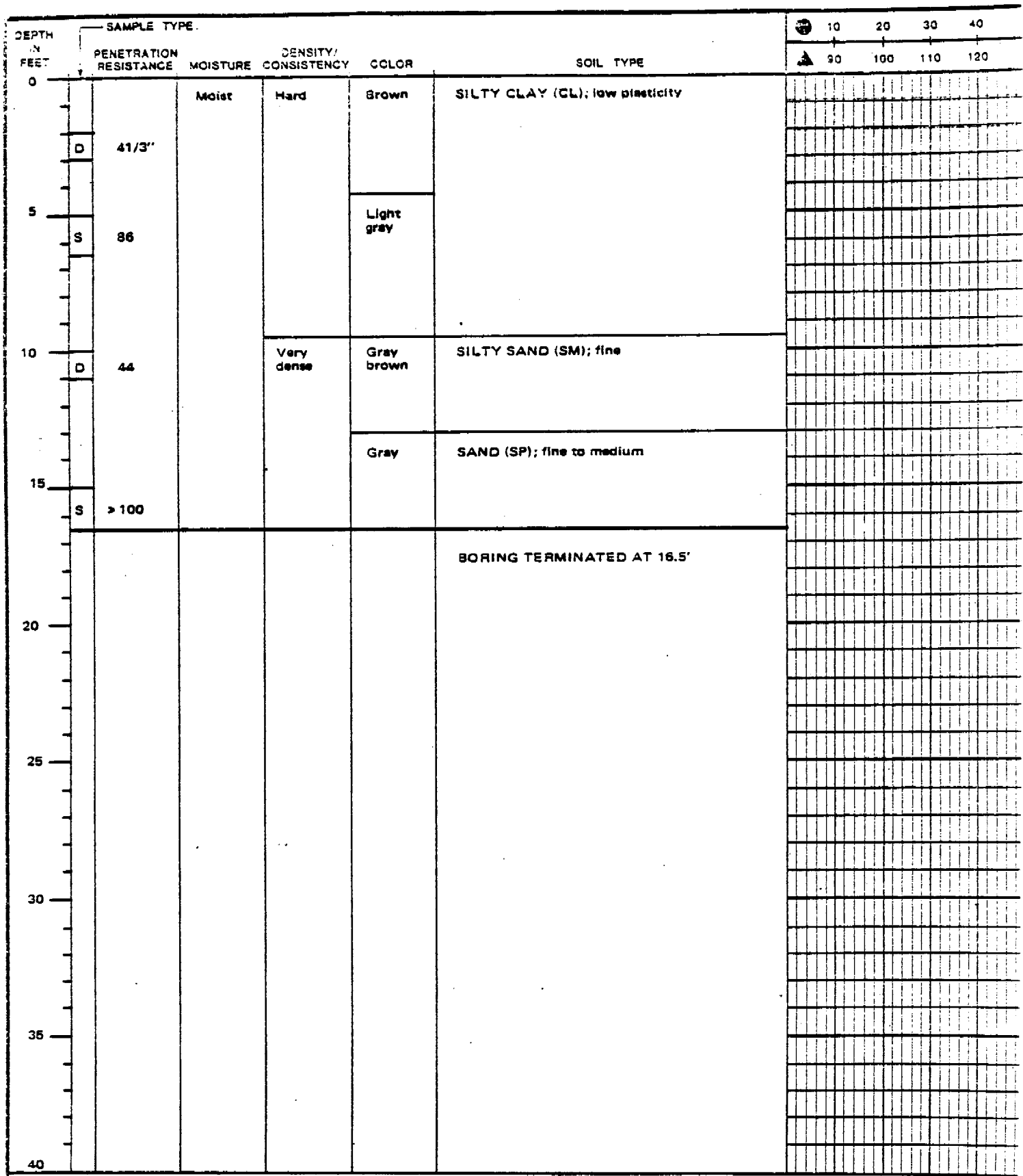
PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-6

7-80

FIGURE A-6



ELEVATION:

DATE DRILLED: 6-4-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-7

7-80

FIGURE A.7

COMPILED BY _____ DRAWN BY L.A.S. 6-80 CHECKED BY _____ APPROVED BY _____ E 1 6 78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff to very stiff	Brown	SILTY CLAY (CL); low plasticity
	S	12				
5	D	29				
					Gray brown	SANDY SILT (ML); low plasticity, fine sand
10	S	8		Loose		SILTY SAND (SM); fine to medium (NONPLASTIC)
				Very dense	Gray	SAND (SP); fine
15	D	65				
						BORING TERMINATED AT 16.0'
20						
25						
30						
35						
40						

10 20 30 40

80 100 110 120

COMPILED BY _____ DRAWN BY L. Nut 6-80 CHECKED BY _____ APPROVED BY _____ E-1 6-78

ELEVATION:

DATE DRILLED: 6-4-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-8

7-80

FIGURE A.8

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff	Brown	SILTY CLAY (CL); low plasticity
	D	14				
5	S	15				
				Dense	Light brown	SILTY SAND (SM); fine to medium
10	D	45				
				Stiff		SANDY SILT (ML); low plasticity
15	S	82		Very dense	Gray brown	SAND (SP); fine to medium
						BORING TERMINATED AT 16.5'
20						
25						
30						
35						
40						

● 10 20 30 40

▲ 90 100 110 120

COMPILED BY _____ DRAWN BY L.L.S. 6-80 CHECKED BY _____ APPROVED BY _____ E-1 6-78

ELEVATION:

DATE DRILLED: 6-4-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-9

7-80

FIGURE A.9

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Very stiff to hard	Red brown	SILTY CLAY (CL); low to medium plasticity
	S	20				
5	D	42				
				Very dense	Light brown	SAND (SP); fine
10	S	56				SILTY SAND (SM); fine
						BORING TERMINATED AT 11.5'
15						
20						
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 20

COMPILED BY _____ DRAWN BY L. Hintz 6-80 CHECKED BY _____ APPROVED BY _____ E-1 5-78

ELEVATION:
DATE DRILLED: 6-2-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-10

7-80

FIGURE A.10

E-1 6-78

COMPILED BY _____ DRAWN BY L. Hall 6-80 CHECKED BY _____ APPROVED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Hard	Brown	SILTY CLAY (CL); low plasticity
	S	50				
5	D	82				
					Gray brown	SANDY SILT (ML); low plasticity
10	S	58		Very dense		SILTY SAND (SM); fine to medium
						BORING TERMINATED AT 11.5'
15						
20						
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 6-4-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-11

7-80

FIGURE A.11

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ E-1 6-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Hard	Brown	SILTY CLAY (CL); low plasticity
	S	56				
5	D	40				
10	S	38			Brown	SANDY SILT (ML); low plasticity
				Very dense	Light brown	SILTY SAND (SM); fine to medium
					Gray	SAND (SP); fine to medium
15	D	53				
20	S	78				
						BORING TERMINATED AT 21.5'
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 6-3-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-12

7-80

FIGURE A.12

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff to very stiff	Gray	SILTY CLAY (CL); low plasticity
	S	22				
5					Dark gray	with fine sand from 5' to 8'
	S	17				
				Hard	Brown	
10	D	49				
				Very dense	Light brown	SAND (SP); fine to medium with some coarse and gravel to 3/8"
15	S	78				
						BORING TERMINATED AT 16.5'
20						
25						
30						
35						
40						

● 10 20 30 40

▲ 90 100 110 120

E-1 6-78

APPROVED BY

CHECKED BY

6-80

DRAWN BY A. Ruiz

COMPILED BY

ELEVATION:

DATE DRILLED: 6-3-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-13

7-80

FIGURE A-1:

E-1 6-78

COMPILED BY _____ DRAWN BY L. Lit 6-80 CHECKED BY _____ APPROVED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	S	5	Moist	Firm	Brown	SILTY CLAY (CL); low plasticity
10	S	5		Loose to medium dense	Light brown	SILTY SAND (SM); fine to medium
15	D	17				SAND (SP); fine to medium, with occasional coarse
20	D	81		Very dense	Gray	
40						BORING TERMINATED AT 21.5'

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 6-3-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-14

7-80

FIGURE A-14

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	36	Moist	Very stiff to hard	Brown	SILTY CLAY (CL); low plasticity
5	S	4		Firm		SANDY CLAY (CL); low plasticity, fine to medium sand
10	D	5			Gray	SILTY CLAY (CL); medium plasticity
15	S	47		Dense to very dense		SAND (SP); fine to medium
20	D	74				with clay lens at 20'
25						BORING TERMINATED AT 21.0'
30						
35						
40						

10 20 30 40

90 100 110 120

COMPILED BY _____ DRAWN BY K. Nitz 6-80 CHECKED BY _____ APPROVED BY _____ E-1 5-78

ELEVATION:

DATE DRILLED: 6-3-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-15

7-80

FIGURE A-15

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	S	100/5"	Moist	Hard	Red brown	SILTY CLAY (CL); low plasticity
5	D	91				
				Very dense	Gray brown	SAND (SP); fine to medium
10	S	62				
15	D	50				
						BORING TERMINATED AT 16.0'
20						
25						
30						
35						
40						

● 10 20 30 40

▲ 90 100 110 120

COMPILED BY _____ DRAWN BY L. Bitz 6-80 CHECKED BY _____ APPROVED BY _____ E-1 5-78

ELEVATION:

DATE DRILLED: 6-2-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-16

7-80

FIGURE A.16

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	12	Moist	Very stiff	Red brown	SANDY CLAY (CL); low plasticity, fine sand
5	D	16				
10	D	53		Hard	Blue gray	SANDY SILT (ML); low plasticity
15	D	45		Dense	Gray	SAND (SP); fine to medium, with occasional coarse
						gravel at 17'
20	D	55		Very dense		
25	D	76				
						gravel at 28'
30	D	94				
35	D	100 NR				grading coarser at 36'
	D	99				
40	D	90				NOTE: Last sample taken from 40' to 41' BORING TERMINATED AT 41'

● 10 20 30 40
▲ 90 100 110 120

COMPILED BY _____ DRAWN BY E. Nitz 6-80 CHECKED BY _____ APPROVED BY _____ E-1 5-78

ELEVATION:
DATE DRILLED: 5-28-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

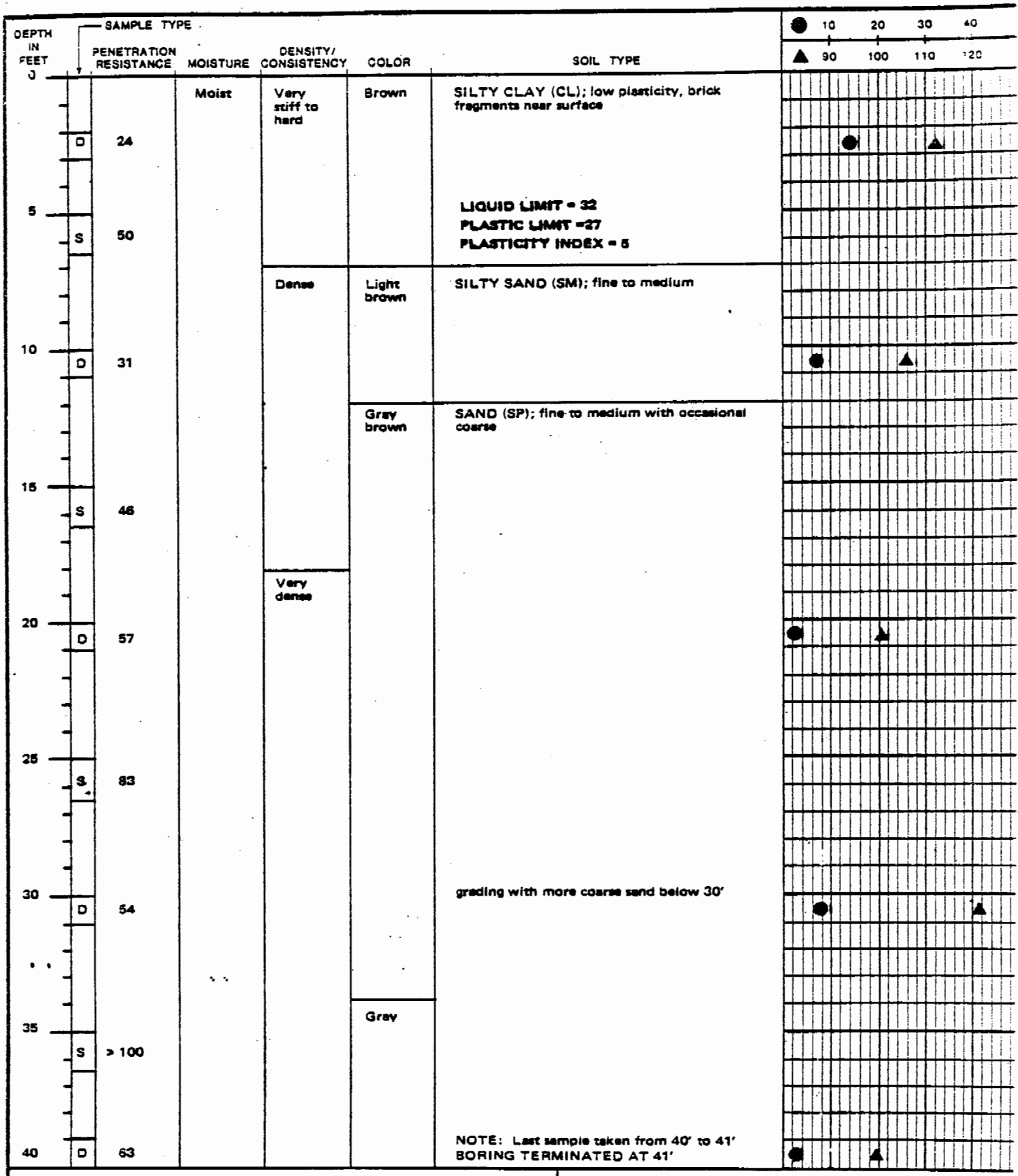
PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-17

7-80

FIGURE A-17



ELEVATION:

DATE DRILLED: 6-2-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWEPINE REFINERY

LOG OF BORING NO. B-18

7-80

FIGURE A.18

COMPILED BY _____ DRAWN BY L.H.T. 6-80 CHECKED BY _____ APPROVED BY _____ E-1 6-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff to very stiff	Red brown	SANDY CLAY (CL; low plasticity, fine sand
	D	15				
5	S	29				
10					Brown	SANDY SILT (ML); low plasticity, fine sand
	D	25				
				Very dense	Light brown to brown	SAND (SP); fine to medium
15	S	63				
20	D	40				
25	S	84				
30	D	86,NR			Gray	
35	S	76				grading with coarse sand and occasional gravel to 1"
40						

10 20 30 40

90 100 110 120

COMPILED BY _____ DRAWN BY L. Hall 10-80 CHECKED BY _____ APPROVED BY _____ E-1 5-75

ELEVATION:

DATE DRILLED: 5-28-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: 92' DURING DRILLING

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-19

SHEET 1 OF 4

7-80

FIGURE A-19

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
40	D	77	Moist	Very dense	Gray	SAND (SP); fine to medium, with occasional coarse
45	S	>100				
50	D	66				
55	S	>100				
60	D	72		Hard	Dark gray	CLAYEY SILT (ML); low plasticity
65	S	>100		Very dense	Gray	SAND (SP); fine to medium
70	D	70				
75	S	>100				SILTY SAND (SM); fine to medium
80						with sandy silt lens at 80'

10 20 30 40
90 100 110 120

COMPILED BY _____ DRAWN BY L. Hitz 6-80 CHECKED BY _____ APPROVED BY _____ E-1 5-78

ELEVATION:
DATE DRILLED: 5-28-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: 92' DURING DRILLING

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

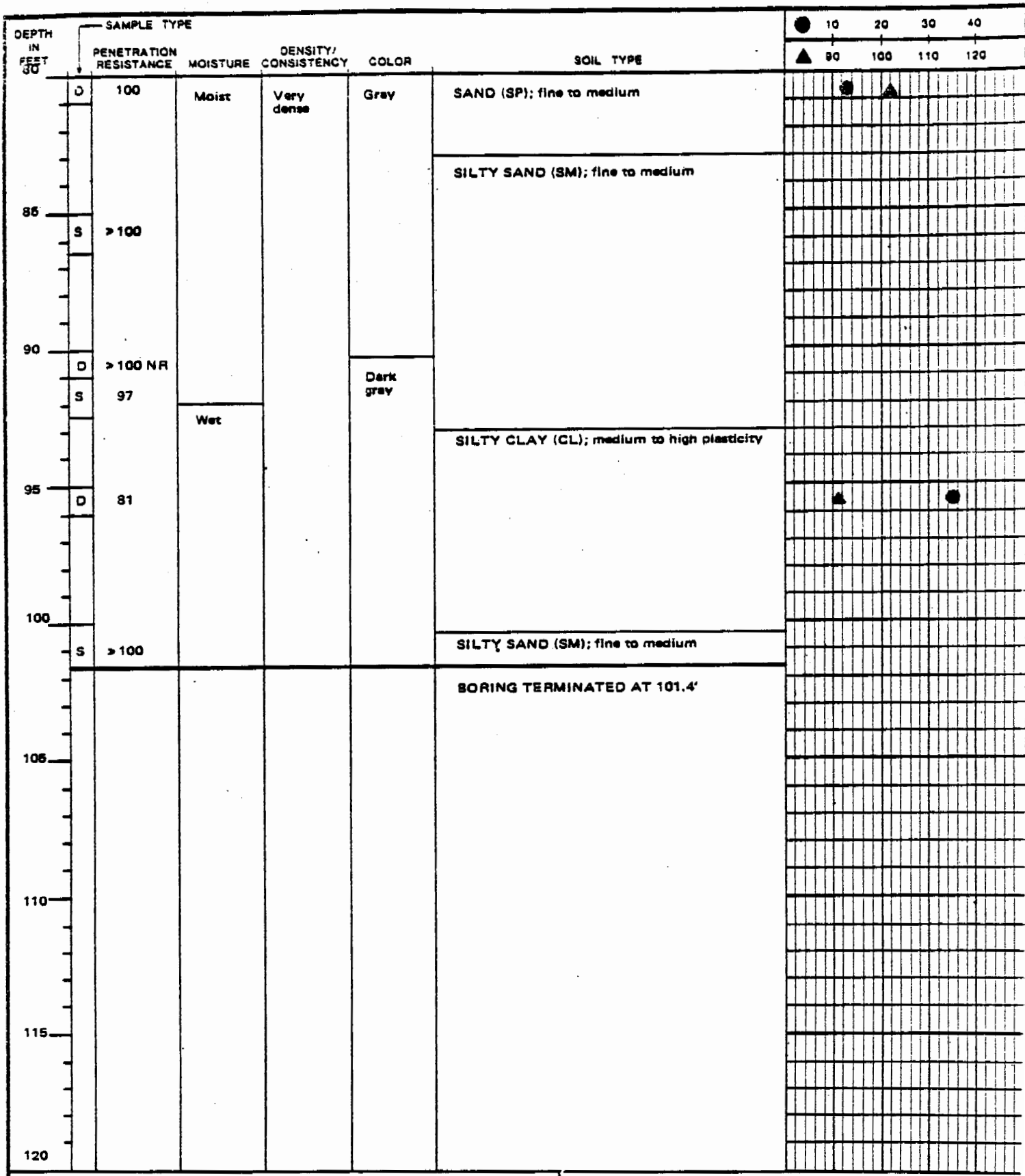
PROJECT NO.: 90-203

POWERINE REFINERY

LOG OF BORING NO. B-19
SHEET 2 OF 4

7-80

FIGURE A.19



ELEVATION:

DATE DRILLED: 5-28-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: 92' DURING DRILLING

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-19
SHEET 3 OF 4

7-80

FIGURE A-19

COMPILED BY _____ DRAWN BY L. Ruiz 6-80 CHECKED BY _____ APPROVED BY _____ E-1 6-78

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ E-1 6-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	S	33	Moist	Hard	Brown	SANDY CLAY (CL); low plasticity, with oil
5	D	40			Light brown	SILTY CLAY (CL); low plasticity
10	S	28		Medium dense to dense		SILTY SAND (SM); fine
15	D	60		Very dense	Gray	SAND (SP); fine to medium with occasional gravel to 1/2"
20	S	>100				silty sand lens at 20'
25	D	>100 NR				
30	D	77				
35	S	>100				
40	D	78				NOTE: Last sample from 40' to 41' SILTY CLAY at 41' BORING TERMINATED AT 41'

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 6-2-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-20

7-80

FIGURE A.20

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	26	Moist	Stiff to very stiff	Red brown	SILTY CLAY (CL); low to medium plasticity
5	S	15				
10	D	11		Medium dense	Gray	SILTY SAND (SM); fine
15	S	43		Dense		SAND (SP); fine to medium, with occasional coarse and occasional gravel to 1/2"
20	D	65.NR		Very dense		grading coarser
	S	74				
25						BORING TERMINATED AT 22.5'
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

E-1 6-78
APPROVED BY
CHECKED BY
6-80
DRAWN BY L.M.T.
COMPILED BY

ELEVATION:
DATE DRILLED: 6-2-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

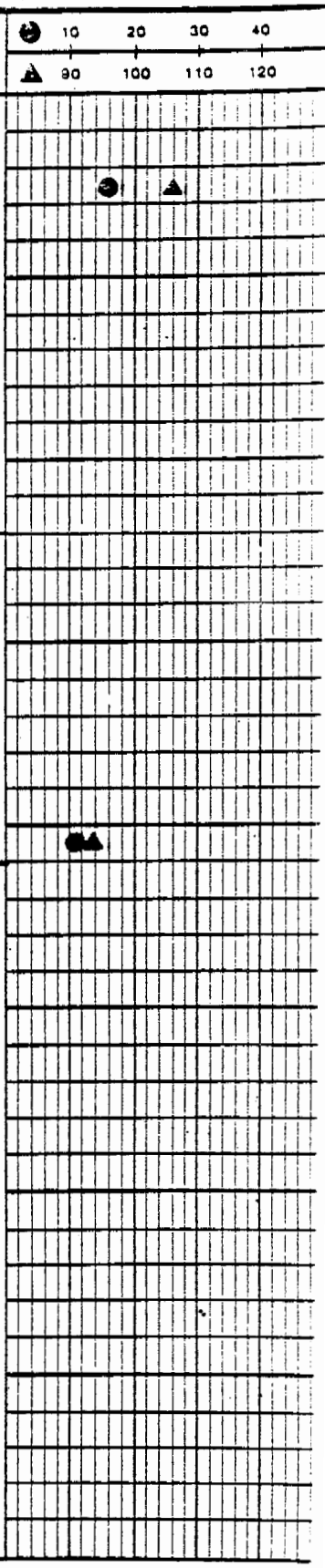
POWERINE REFINERY

LOG OF BORING NO. B-21

7-80

FIGURE A.21

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	25	Moist	Hard	Red brown	SILTY CLAY (CL); low to medium plasticity
5	S	54			Light brown	
10	D	42				LIQUID LIMIT = 36 PLASTIC LIMIT = 24 PLASTICITY INDEX = 12
15	S	58		Very dense	Gray	SAND (SP); fine to coarse
20	D	57				
25						BORING TERMINATED AT 21.0'
30						
35						
40						



ELEVATION:

DATE DRILLED: 6-2-80

EQUIPMENT USED: 8 ' HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-22

7-80

FIGURE A.2

COMPILED BY _____ DRAWN BY L.Nish 6-80 CHECKED BY _____ APPROVED BY _____ L-1 6 78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Very stiff to hard	Red brown	SILTY CLAY (CL); low to medium plasticity
	S	33				
					Light brown	
5	D	25				
				Dense	Gray	SAND (SP); fine to medium
10	S	43				
						BORING TERMINATED AT 11.5'
15						
20						
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ E-1 6-70

ELEVATION:
DATE DRILLED: 6-2-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-23

7-80

FIGURE A.23

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	8	Moist	Firm	Brown	SILTY CLAY (CL); low to medium plasticity with occasional gravel to 1"
5	S	6				
10	D	22		Very dense	Gray	SAND (SP); fine
15	S	59				grading with medium and coarse
20	D	57				
						BORING TERMINATED AT 21.0'
25						
30						
35						
40						

10 20 30 40
90 100 110 120

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

ELEVATION:
DATE DRILLED: 6-2-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-24

7-80

FIGURE A-24

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ E-1 6-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	S	12	Moist	Firm to stiff	Red brown	SILTY CLAY (CL); low to medium plasticity
5	D	11			Brown	
10	S	8		Loose	Gray	SILTY SAND (SM); fine, occasional medium
						BORING TERMINATED AT 11.5'

15 20 25 30 35 40

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 6-2-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

S STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
D FUGRO 2 1/2" DRIVE SAMPLE
B BULK SAMPLE
T THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-25

7-80

FIGURE A-25

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	D	19	Moist	Stiff	Brown	SILTY CLAY (CL); low plasticity
5	S	21		Very stiff	Light grey	SANDY SILT (ML); low plasticity, fine sand
10	D	34				
15	S	42		Dense	Grey	SILTY SAND (SM); fine, with thin clay lenses
						SAND (SP); fine
						BORING TERMINATED AT 16.5'
20						
25						
30						
35						
40						

10 20 30 40

90 100 110 120

ELEVATION:

DATE DRILLED: 6-5-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-26

7-80

FIGURE A-26

COMPILED BY _____ DRAWN BY L.N.T. 6-80 CHECKED BY _____ APPROVED BY _____ E-1 5-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Very stiff	Brown	SILTY CLAY (CL); low plasticity
5	S	16				
	D	13				
10					Light brown	SANDY SILT (ML); low plasticity
	S	48				
				Dense		SILTY SAND (SM); fine
15	D	46				
				Very dense	Gray	SAND (SP); fine to medium
20	S	98				
						BORING TERMINATED AT 21.5'
25						
30						
35						
40						

● 10 20 30 40

▲ 90 100 110 120

ELEVATION:

DATE DRILLED: 6-5-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-27

7-80

FIGURE A.27

COMPILED BY _____ DRAWN BY L. Hill 6/80 CHECKED BY _____ APPROVED BY _____ E-1 6-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff	Red brown	SILTY CLAY (CL) and CLAYEY SILT (ML); low to medium plasticity
	D	13				
5	D	10				
					Brown	
10	S	25		Very stiff		
15	D	37				sandy clay from 14' to 17'
20	D	33				
25	S	22				
				Dense to very dense	Gray	SILTY SAND (SM); fine to coarse
30	D	>100				
35	D	68				
40						clean sand (SP) from 39' to 42'

10 20 30 40

30 100 110 120

ELEVATION:

DATE DRILLED: 5-29-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

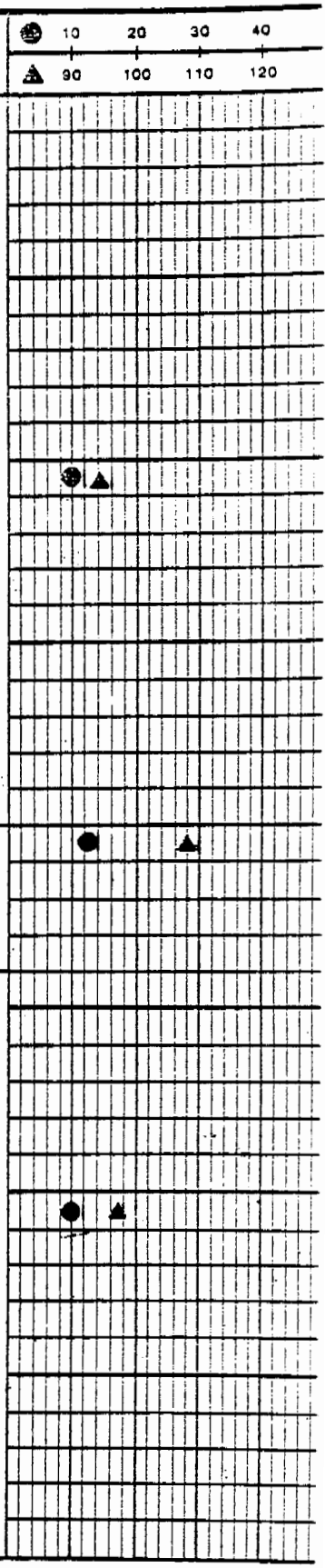
LOG OF BORING NO. B-28
SHEET 1 OF 3

7-80

FIGURE A-28

COMPILED BY _____ DRAWN BY L.M.S. 6-18 CHECKED BY _____ APPROVED BY _____ E-1 6-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	S	>100	Moist	Dense to very dense	Gray	SILTY SAND (SM); fine to coarse gravel to 1" from 42' to 48'
45	D	>100				clean sand (SP) from 48' to 53'
50	D	64				
55	D	100/3"				
60	D	80		Hard		SILTY CLAY (CL); low plasticity, with sand lenses
65	D	22		Dense to very dense		SAND (SP); fine to medium
	S	>100				
70	D	93				
75	D	>100 NR				
80						



ELEVATION:
DATE DRILLED: 5-29-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-28
SHEET 2 OF 3

7-80

FIGURE A.28

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ E-1 1-78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
80	C	100/4"	Moist	Dense to very dense	Gray	with gasoline odor below 80'
	S	63/6"				
85	D	87				
				Hard		CLAYEY SILT (ML); low plasticity, with lenses of silty sand (SM)
90	D	>100				
95	D	100/4"				
100	S	100/3"				
						BORING TERMINATED AT 100.9'
105						
110						
115						
120						

10 20 30 40
40 100 110 120

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ 6-80

ELEVATION:
DATE DRILLED: 5-29-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-28
SHEET 3 OF 3

7-80

FIGURE A.28

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist			POSSIBLE FILL - SANDY SILT (ML); low plasticity, asphalt fragments
	S	45		Hard	Brown	SILTY CLAY (CL); low plasticity, with occasional silt (ML) lenses
5	D	52,NR				
10	D	10				
				Firm to stiff	Light brown	SANDY SILT (ML); low plasticity
15	S	50		Very dense	Gray	SILTY SAND (SM); fine
				Hard	Mottled brown and gray	SILTY CLAY (CL); low plasticity
20	D	52				
				Very dense	Gray brown	SAND (SP); fine to medium
25	S	68				
30	D	62				
						BORING TERMINATED AT 31.0'
35						
40						

10 20 30 40

90 100 110 120

COMPILED BY _____ DRAWN BY L. Nitz 6-80 CHECKED BY _____ APPROVED BY _____ E-1 to 78

ELEVATION:

DATE DRILLED: 6-4-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

DRY DENSITY (LB/CU FT)

FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

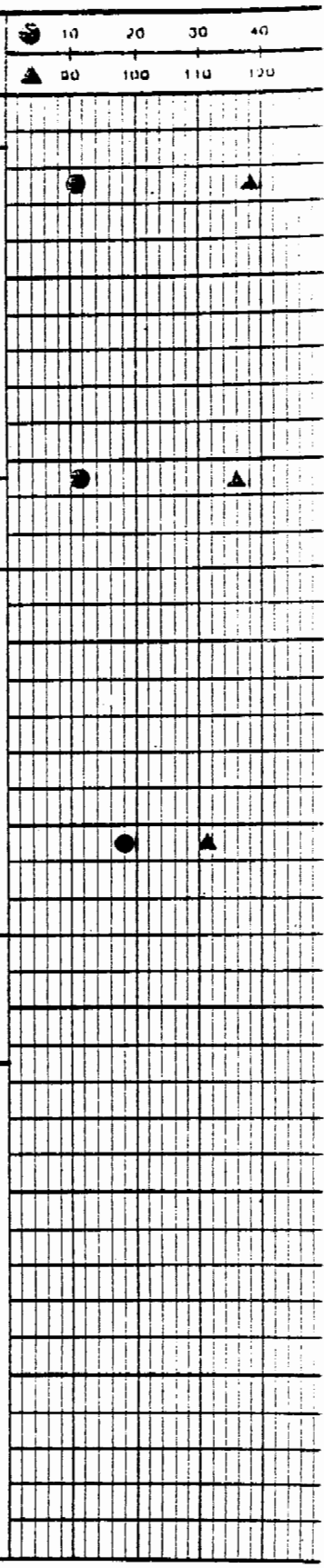
POWERINE REFINERY

LOG OF BORING NO. B-29

7-80

FIGURE A.29

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Very stiff	Brown	POSSIBLE FILL - SANDY SILT (ML); low plasticity, concrete fragments
						SILTY CLAY (CL); low plasticity
	D	57				
5	S	28				
10	D	20		Medium dense	Light brown	SILTY SAND (SM); fine to medium
				Very stiff	Gray brown	SILTY CLAY (CL); low plasticity
15	S	34				
20	D	38				
				Dense	Light gray brown	SILTY SAND (SM) ; fine to medium
25	S	42				
						BORING TERMINATED AT 26.5'
30						
35						
40						



ELEVATION:

DATE DRILLED: 6-5-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-30

7-80

FIGURE A.30

COMPILED BY _____ DRAWN BY L. Hall 6-9-80 CHECKED BY _____ APPROVED BY _____ E 1 6 78

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Loose	Brown	SILTY SAND (SM); fine to medium, trace clay
	D	8				
5	S	9				
				Medium dense	Light brown	
10	D	15				
15	S	80				with gravel lenses below 14'
						BORING TERMINATED AT 16.5'
20						
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

COMPILED BY _____ DRAWN BY L. Hutto 10-80 CHECKED BY _____ APPROVED BY _____ 11-6-78

ELEVATION:
DATE DRILLED: 6-5-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

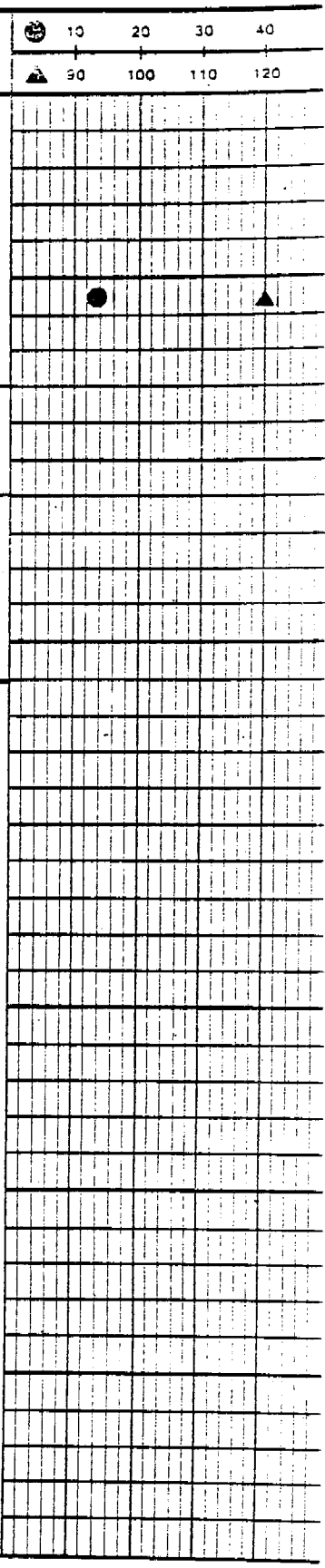
POWERINE REFINERY

LOG OF BORING NO. B-31

7-80

FIGURE A.31

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Very stiff	Brown	SILTY CLAY (CL); low plasticity
5	S	17		Hard		
	D	49				
10					Gray	SANDY SILT (ML); low plasticity, fine sand
	S	36		Dense		SILTY SAND (SM); fine
15	D	39 NR				
						BORING TERMINATED AT 16.0'
20						
25						
30						
35						
40						



COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

ELEVATION:

DATE DRILLED: 6-5-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D-1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-32

7-80

FIGURE A.32

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Firm to stiff	Brown	SILTY CLAY (CL); low plasticity
5	D	6				sandy clay from 5' to 10'
10	D	9				
15	D	13		Medium dense	Gray brown	SANDY SILT (ML); low plasticity, fine sand
20	D	85		Dense		SILTY SAND (SM); fine to medium
21						BORING TERMINATED AT 21.0'

● 10 20 30 40

▲ 90 100 110 120

ELEVATION:

DATE DRILLED: 6-4-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM.D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-33

7-80

FIGURE A.33

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ E 1 5 /5

E-1 5-78

COMPILED BY _____ DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

SAMPLE TYPE

DEPTH IN FEET		PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Firm to stiff	Brown	SILTY CLAY (CL); low plasticity
5	D	9 NR				sandy clay from 5' to 8'
10	D	11				SANDY SILT (ML); low plasticity, fine sand
				Medium dense		SILTY SAND (SM); fine
15	D	57 NR		Very dense	Gray	SAND (SP); fine to medium
						gravel at 18' to 3/4"
20	D	82				
						BORING TERMINATED AT 21.0'
25						
30						
35						
40						

● 10 20 30 40

▲ 90 100 110 120

ELEVATION:

DATE DRILLED: 6-4-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

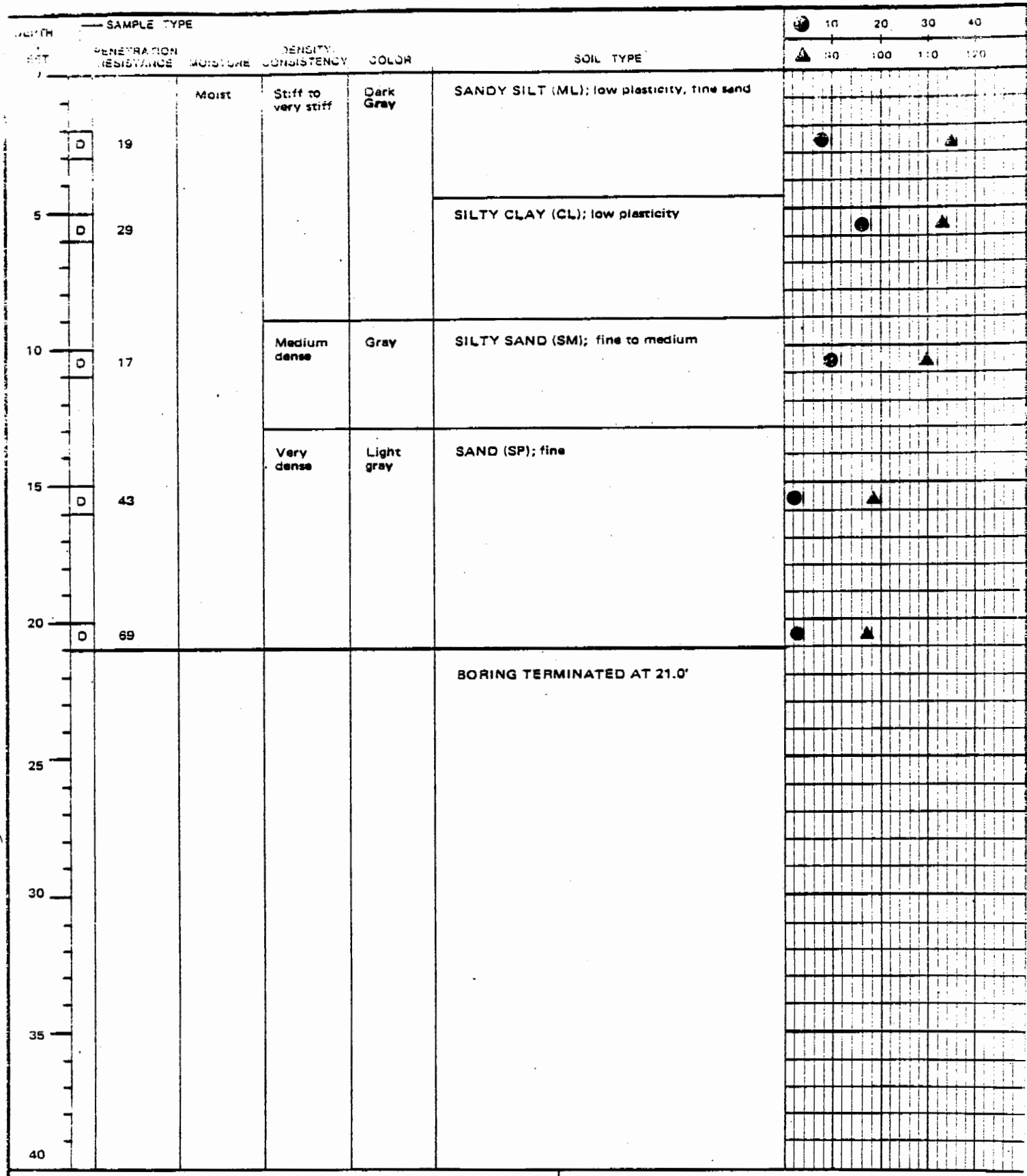
PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-34

7-80

FIGURE A.34



ELEVATION:

DATE DRILLED: 6-5-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-35

7-80

FIGURE A.35

COMPILED BY ... DRAWN BY ... CHECKED BY ... APPROVED BY ...

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff	Mottled brown	POSSIBLE FILL - SILTY CLAY (CL); low plasticity
	S	12				
5	D	12				
				Medium dense	Brown	SILTY SAND (SM); fine
10	S	14		Stiff		SILTY CLAY (CL); low plasticity
				Medium dense	Light brown	SILTY SAND (SM); fine
15	D	14				
						BORING TERMINATED AT 16.0'
20						
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED
DATE DRILLED: 6-5-80

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)
▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-36

7-80

FIGURE A.36

DRAWN BY CHECKED BY APPROVED BY COMPILED BY

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Stiff	Dark brown	POSSIBLE FILL-SILTY CLAY (CL); low plasticity, asphalt fragments
	D	15				SANDY SILT (ML); low plasticity, fine to medium sand
5	D	14			Brown	SILTY CLAY (CL); low plasticity
10	D	16				
				Medium dense	Gray brown	SAND (SP); fine
15	D	27				
						BORING TERMINATED AT 16.0'
20						
25						
30						
35						
40						

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 6-5-80
EQUIPMENT USED: 8" HSA
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-37

7-80

FIGURE A.37

COMPILED BY ____ DRAWN BY L. Nutz 6/88 CHECKED BY ____ APPROVED BY ____ E-1 5 18

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0						
	D	30	Moist	Hard	Brown	SILTY CLAY (CL); low plasticity
5	D	16		Very stiff		
				Firm	Light brown	SANDY SILT (ML); low plasticity, fine to medium sand
10	D	7				
				Medium dense	Gray brown	SAND (SP); fine to medium
15	D	21				
20	D	32				
						BORING TERMINATED AT 21.0'
25						
30						
35						
40						

10 20 30 40

90 100 110 120

COMPILED BY _____ DRAWN BY L. Nitz CHECKED BY 6-80 APPROVED BY _____ E 1 5 78

ELEVATION:

DATE DRILLED: 6-5-80

EQUIPMENT USED: 8" HSA

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-203

POWERINE REFINERY

LOG OF BORING NO. B-38

7-80

FIGURE A.38

E-1 5-78

DRAWN BY _____ CHECKED BY _____ APPROVED BY _____

COMPILED BY _____

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0			Moist	Very stiff	Dark gray brown	SILTY CLAY (CL), medium plasticity
	S	19				
	D	15			Dark gray	
5						
				Stiff		SANDY CLAY (CL), low plasticity, very fine sand
10	S	8				
				Very dense	Dark gray	CLAYEY SAND (SC), fine
	D	50/10"				
15						
			Dry	Hard	Light	SILTY CLAY (CL), low plasticity
20	S	42				
			Moist	Very dense	Dark gray	SAND (SP-SM), fine
	D	70/11"				
25						
			Dry	Hard	Dark brown	SILTY CLAY (CL-CH), medium to high plasticity
30	S	55				
			Slightly moist			medium plasticity (CL)
	D	47				
35						BORING TERMINATED AT 34.7'
40						

● 10 20 30 40

▲ 90 100 110 120

ELEVATION:

DATE DRILLED: 9-3-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

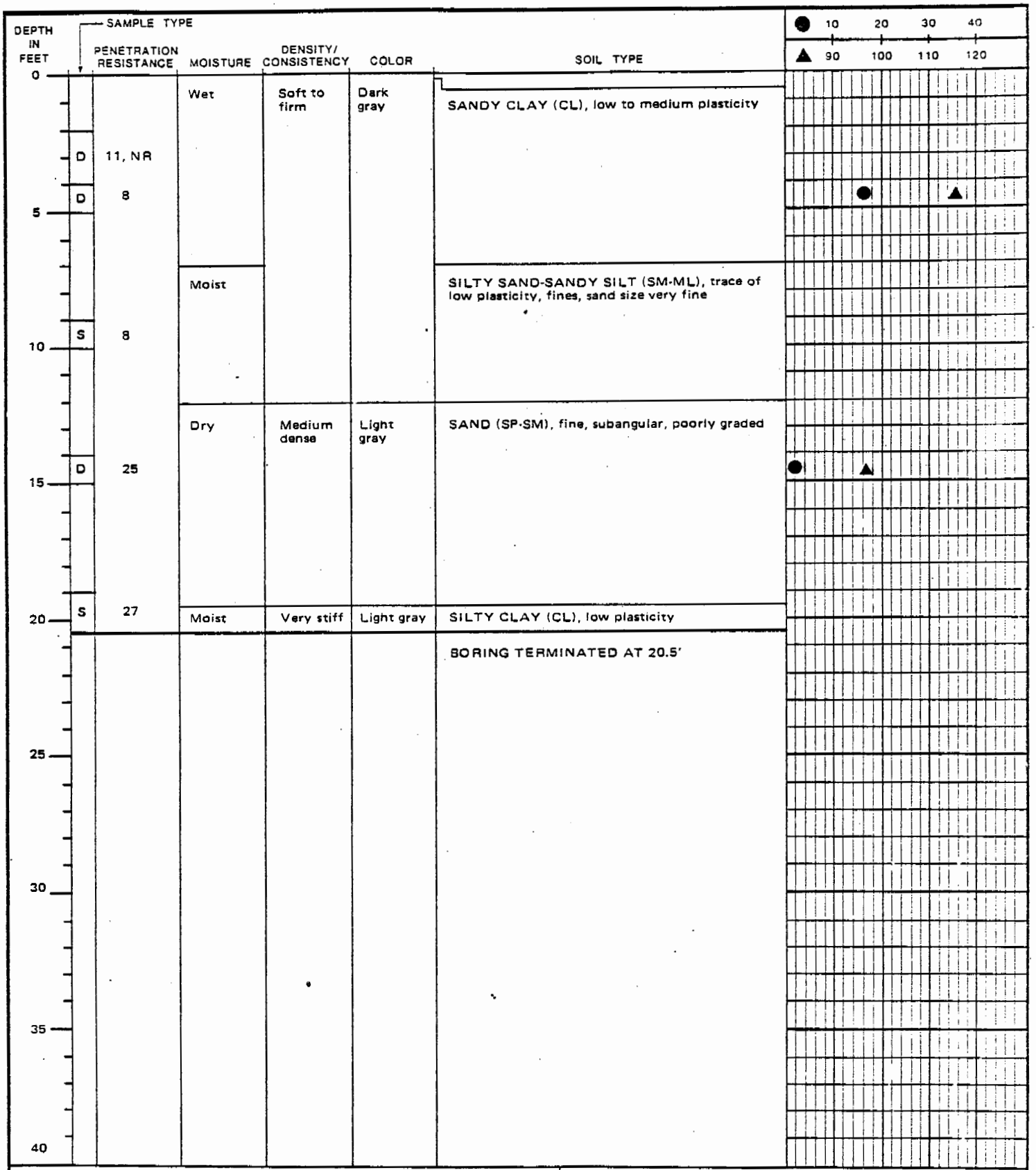
PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. C-1

10-80

FIGURE A-11



ELEVATION:

DATE DRILLED: 9-2-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. C-2

10-80

FIGURE A-12

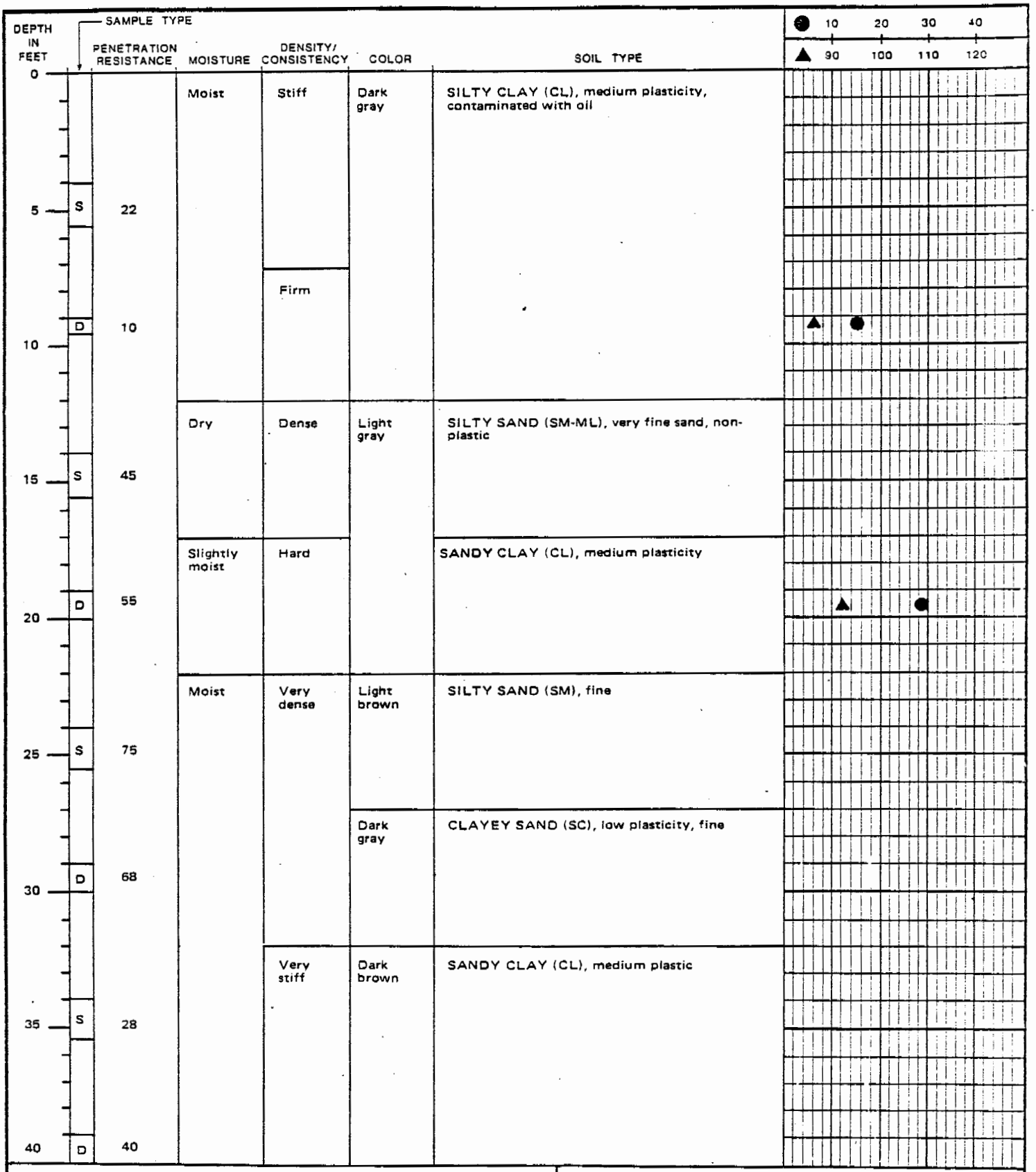
E-1 5-78

APPROVED BY

CHECKED BY

DRAWN BY

COMPILED BY



ELEVATION: DATE DRILLED: 9-2-80

EQUIPMENT USED: 8' HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. C-3

(SHEET 1 OF 2)

10-80

FIGURE A 13

E-1 6-78 APPROVED BY CHECKED BY DRAWN BY COMPILED BY

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
40			Moist	Dense to very dense	Light gray	SILTY SAND to SAND (SM to SP-SM), fine to medium
45	S	56				
50	D	39		Hard	Gray brown	SILTY CLAY (CL-CH), medium to high plasticity
55	S	33				
			Dry	Very dense	Gray	SAND (SP to SW), fine to coarse, trace of gravel
60	D	68				
65	S	78				
70	D	70				
75	S	53				
80	D	57				BORING TERMINATED AT 79.5'

● 10 20 30 40
▲ 90 100 110 120

ELEVATION:
DATE DRILLED: 9-2-80
EQUIPMENT USED: 8" HOLLOW STEM AUGER
WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)
[D] FUGRO 2 1/2" DRIVE SAMPLE
[B] BULK SAMPLE
[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)
● FIELD MOISTURE (% DRY WT) (ASTM D2216)
NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. C-3
(SHEET 2 OF 2)

10-80

FIGURE A-13

COMPILED BY ____ DRAWN BY ____ CHECKED BY ____ APPROVED BY ____ E-1 5-78

E-1 6-78

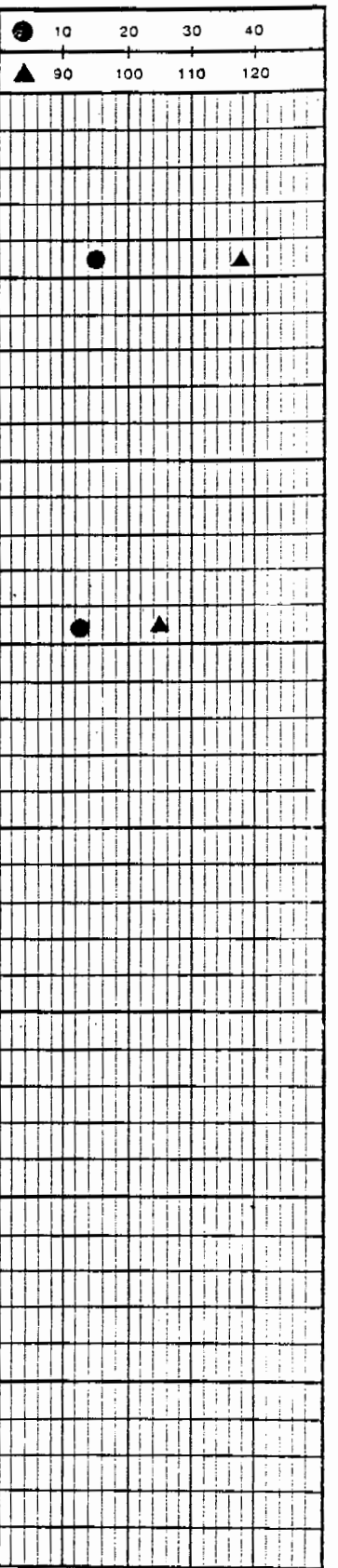
APPROVED BY

CHECKED BY

DRAWN BY

COMPILED BY

DEPTH IN FEET	SAMPLE TYPE	PENETRATION RESISTANCE	MOISTURE	DENSITY/ CONSISTENCY	COLOR	SOIL TYPE
0	S	37	Moist	Stiff to very stiff	Dark gray	SILTY CLAY (CL), low to medium plasticity, increasing very fine sand content with depth
	D	21				
5						
10	S	14				
15	D	37		Hard	Dark gray	SANDY SILT (ML), low plasticity to non-plastic
						SANDY CLAY (CL), low plasticity, scattered cemented nodules
20	S	41				
						BORING TERMINATED AT 20.5'
25						
30						
35						
40						



ELEVATION:

DATE DRILLED: 9-2-80

EQUIPMENT USED: 8" HOLLOW STEM AUGER

WATER LEVEL: NOT ENCOUNTERED

[S] STANDARD SPLIT SPOON SAMPLE (ASTM D1586)

[D] FUGRO 2 1/2" DRIVE SAMPLE

[B] BULK SAMPLE

[T] THIN WALL TUBE SAMPLE (ASTM D1587)

▲ DRY DENSITY (LB/CU FT)

● FIELD MOISTURE (% DRY WT) (ASTM D2216)

NR NO RECOVERY

FUGRO

PROJECT NO.: 80-241

POWERINE REFINERY

LOG OF BORING NO. C-4

10-80

FIGURE A-15